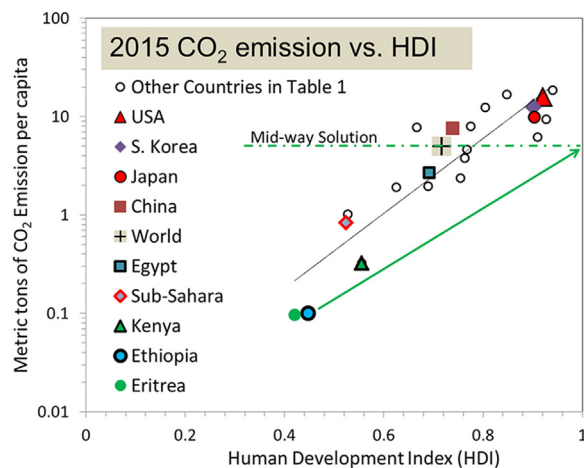


# Should Ethiopia and least developed countries exit from the Paris climate accord? – Geopolitical, development, and energy policy perspectives

Tadesse Weldu Teklu

## GRAPHICAL ABSTRACT



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 Climate Change as a Neo-Cold-War Instrument

## ABSTRACT

In this study, it is argued, Ethiopia should in principle agree with the World in international climate change agreements (such as the Paris climate accord), purely to avoid any political and economic sanctions from “*Earth friendly*” nations and institutions; however, she should avoid becoming carbon neutral at the expense of adding costs and slowing her industrial development prospects. In fact, since CO<sub>2</sub> emission (energy consumption) is directly correlated to economic prosperity and industrialization (see Table 1 and Figure 1), Ethiopia should plan to increase her CO<sub>2</sub> emission per capita as much as possible.

Ethiopia should understand that climate agreements such as the Paris accord are designed and destined to fail. Hence, Ethiopia should avoid carbon-tax, different form of financial aid, **poverty-trap**; instead she should plan on how to live with the inevitable global atmospheric CO<sub>2</sub> concentration increase. The same is true for majority of least developed countries (LDCs).

Global climate change issue could be a neo-colonialism and neo-cold-war instruments designed by neo-liberal institutions; hence, if Ethiopia is willing to confront any political and economic burden from “*Earth friendly*” nations and institutions, Ethiopia should lead other Africans’ towards the **mid-way solution**; and if “*Earth friendly*” countries does not agree with such just and simple solution; then, Ethiopia should lead Africa, in following USA, and exit from the Paris climate accord. In doing so, Ethiopia may repeat the leadership role she played during African decolonization struggle.

E-mail address: [tadesseweldu@gmail.com](mailto:tadesseweldu@gmail.com).

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## 1. Introduction

Most scientists and politicians state global warming or climate change argument caused by anthropogenic CO<sub>2</sub> concentration increase is “settled”<sup>1</sup> and it is time to “act”. Such statements are widely accepted not because they are true<sup>2,3</sup> but it is because they are stated by world leaders including President Obama in his 2014 State of the Union address.<sup>4</sup> In stating so, probably Obama was expecting to receive additional Noble Peace Prize “... for his effort to fight climate change”,<sup>5</sup> or maybe he was trying to prove his first Nobel prize was well deserved.<sup>6</sup>

What these scientists and politicians mean when they say “it is time to act” is that – countries should not increase their current CO<sub>2</sub> emission, in fact they should be obliged or voluntarily “agree” to reduce their current CO<sub>2</sub> emission “budget”,<sup>7</sup> as if the current emission “budget” is fairly distributed among all populations of the world.<sup>8</sup>

On the other hand, there are quite significant climate scientists who disagree with the above notions; and as a result, on March 13, 2017, hundreds of scientists signed a petition urging US government, and others, to withdraw from the United Nations Framework Convention on Climate Change (UNFCCC).<sup>9</sup> These notable scientists mainly disagree on the simulation forecast of temperature by IPCC<sup>10</sup> and its impact on environment,

<sup>1</sup> Cook, J., Nuccitelli, D., Green, S.A., Richardson, M., Winkler, B., Painting, R., Way, R., Jacobs, P. and Skuce, A., 2013. Quantifying the consensus on anthropogenic global warming in the scientific literature. *Environmental research letters*, 8(2), p.024024.

<sup>2</sup> Tol, R.S., 2014. Quantifying the consensus on anthropogenic global warming in the literature: A re-analysis. *Energy Policy*, 73, pp.701–705.

<sup>3</sup> Forbes Jan 6, 2015 publication by a contributor Alex Epstein, titled – ‘97% Of Climate Scientists Agree’ Is 100% Wrong <https://www.forbes.com/sites/alexepstein/2015/01/06/97-of-climate-scientists-agree-is-100-wrong/#6518ded23f9f>.

<sup>4</sup> President Obama in his January 28, 2014 State of the Union Address, stated “... the debate is settled. Climate change is a fact” (<https://obamawhitehouse.archives.gov/the-press-office/2014/01/28/president-barack-obamas-state-union-address>); in the same talk, Obama had to face reality and mentioned the following statement... “It’s not just oil and natural gas production that’s booming; we’re becoming a global leader in solar, too.” This was because, despite his administration’s effort to discourage oil and gas industry and only encouraging “clean energy”, the oil and gas industry was doing very great in the USA in 2014 (by themselves). This was mainly due to multi-stage hydraulic fracturing technology advancement enabling oil and gas industries to unlock tremendous resources from ultra-tight shale reservoirs, which were deemed uneconomical few years earlier (see for example [https://www.eia.gov/outlooks/ieo/pdf/0484\(2017\).pdf](https://www.eia.gov/outlooks/ieo/pdf/0484(2017).pdf), International Energy Outlook 2017 report).

<sup>5</sup> Former US vice president Al Gore shares a 2007 Noble Peace Prize along with Intergovernmental Panel on Climate Change (IPCC) [https://www.nobelprize.org/nobel\\_prizes/peace/laureates/2007/](https://www.nobelprize.org/nobel_prizes/peace/laureates/2007/); according to The Noble Peace Prize committee, Al Gore and IPCC were awarded “for their effort to build up and disseminate greater knowledge about man-made climate change”.

<sup>6</sup> President Obama received a 2009 Noble Peace Prize in Oct. 2009 (just nine months in office) and achieving noting significant for the world peace (see [https://www.nobelprize.org/nobel\\_prizes/peace/laureates/2009/press.html](https://www.nobelprize.org/nobel_prizes/peace/laureates/2009/press.html)) and Obama’s Nobel Prize is now one of the top 10 controversial Nobel Prizes in history (see Time Magazine Oct 07, 2011 edition, Top 10 Nobel Prize Controversies – <http://content.time.com/time/specials/packages/article/0,28804,2096389,2096388,2096378,00.html>).

<sup>7</sup> Article 3 of the Paris Agreement requires signatory to be “ambitious”, “represent a progression over time” and set “with the view to achieving the purpose of this Agreement”. The contributions should be reported every five years and are to be registered by the UNFCCC Secretariat. Each further ambition should be more ambitious than the previous one, known as the principle of ‘progression’ (see [http://unfccc.int/paris\\_agreement/items/9485.php](http://unfccc.int/paris_agreement/items/9485.php)).

<sup>8</sup> Such unfair statements reminds me the argument of Egypt when they demand upstream Nile Basin nations (such as Ethiopia, Rwanda, Tanzania, and Uganda) has to obey with the 1959 agreement on Nile water allocation. The 1959 Nile water allocation agreement was signed between two downstream nations – Egypt and the Sudan, and completely excluded the upstream states (see Arsano, Y., 2007. Ethiopia and the Nile: Dilemmas and National and Regional Hydropolitics. ETH Zurich Research Collection, PhD thesis, [www.isn.ethz.ch](http://www.isn.ethz.ch)).

<sup>9</sup> On March 13, 2017, hundreds of scientists signed a petition urging US government, and others, to withdraw from the United Nations Framework Convention on Climate Change (UNFCCC) (see [https://www.eenews.net/assets/2017/03/14/document\\_daily\\_03.pdf](https://www.eenews.net/assets/2017/03/14/document_daily_03.pdf) and <http://co2coalition.org/about/>).

<sup>10</sup> The Intergovernmental Panel on Climate Change (IPCC) is a scientific and inter-governmental body under the auspices of the United Nations, set up at the request of member governments, dedicated to the task of providing the world with an objective, scientific view of climate change and its political and economic impacts. Its aim is to

and some of them disagree on the residence time of CO<sub>2</sub> in the atmosphere (which they think is leading to the inaccurate temperature forecast due to anthropogenic CO<sub>2</sub> increase, see for example, Harde 2017)<sup>11</sup>; others think that in a millions of years (geologic period), CO<sub>2</sub> fluctuation was lagging temperature increase, hence, temperature increase could be a cause for CO<sub>2</sub> increase in geologic time (rather than the widely “agreed” argument of CO<sub>2</sub> concentration increase causing increase “global warming”), thus, current models should consider such possible scenario in their modeling effort (see for example, Prof. Murry Salby’s April 18, 2013 lecture at the University of Hamburg, Germany<sup>12</sup>); and more importantly and relevant to this study, most of these scientist and others seem to disagree on the “global” policy decision (such as Paris Accord<sup>13</sup>) on how to avert any possible risks of global climate change or global warming. Appendix A lists example of statements by known climate scientists who are skeptical on the current “consensus” by most scientists and IPCC.

In addition, global warming or climate change dominated by anthropogenic (human caused industrial/greenhouse CO<sub>2</sub> emission) hypothesis and institutions such as UNFCCC, IPCC, and others that advocate for such hypothesis deliberately ignore other significant natural source of climate changes that could be the main cause for climate change of our planet for millennia. These natural forces include the Sun, solar irradiance, galactic cosmic ray flux and solar cycle length, aerosols, clouds, water vapor, etc., as can be referred in studies by Soon et al. (1996),<sup>14</sup> Svensmark (1998),<sup>15</sup> Marsh and Svensmark (2003),<sup>16</sup> Shaviv and Veizer (2003),<sup>17</sup> Shaviv, (2005),<sup>18</sup> Svensmark (2007),<sup>19</sup> Raspopov et al. (2008),<sup>20</sup> Svensmark et al.

(footnote continued)

assess scientific information relevant to: (1) Human-induced climate change, (2) The impacts of human-induced climate change, and (3) Options for adaptation and mitigation (see <https://www.ipcc.ch/>).

<sup>11</sup> Harde (2017) reported the residence time of CO<sub>2</sub> in the atmosphere is 4 years; However, IPCC model assumes, “extremely long time scale processes involved in the removal of anthropogenic CO<sub>2</sub> emissions into the atmosphere” (Stocker et al., 2013) —Harde, H., 2017. Scrutinizing the carbon cycle and CO<sub>2</sub> residence time in the atmosphere. *Global and Planetary Change*, 152, pp.19–26.

Stocker, T. et al., 2014. Climate change 2013: the physical science basis: Working Group I contribution to the Fifth assessment report of the Intergovernmental Panel on Climate Change. Cambridge University Press.

<sup>12</sup> Prof. Murry Salby’s talk in Hamburg, Germany, on 18 April 2013, titled: “Relationship between Greenhouse Gases and Global Temperature” – [https://www.youtube.com/watch?v=2R0w\\_cDKwc0](https://www.youtube.com/watch?v=2R0w_cDKwc0).

<sup>13</sup> The Paris climate accord, also known as the Paris agreement, Paris accord, or Paris climate agreement, is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) dealing with greenhouse gas emissions mitigation, adaptation and finance starting in the year 2020. The language of the agreement was negotiated by representatives of 196 parties at the 21st conference of the parties of the UNFCCC in Paris and adopted by consensus on 12 December 2015. As of November 08, 2017, all 197 UNFCCC members have signed the agreement. On June 01, 2017, U.S. President Donald Trump announced his intention to withdraw the United States (USA) from the agreement, causing widespread condemnation both internationally and domestically. The Agreement aims to respond to the global climate change threat by keeping a global temperature rise this century well below 2 degree Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. (see [http://unfccc.int/paris\\_agreement/items/9485.php](http://unfccc.int/paris_agreement/items/9485.php)).

<sup>14</sup> Soon, W.H., Posmentier, E.S. and Baliunas, S.L., 1996. Inference of solar irradiance variability from terrestrial temperature changes, 1880–1993: An astrophysical application of the Sun-climate connection. *The Astrophysical Journal*, 472(2), p.891.

<sup>15</sup> Svensmark, H., 1998. Influence of cosmic rays on Earth’s climate. *Physical Review Letters*, 81(22), p.5027.

<sup>16</sup> Marsh, N. and Svensmark, H., 2003. Solar influence on Earth’s climate. In *Advances in Space Environment Research* (pp. 317–325). Springer, Dordrecht.

<sup>17</sup> Shaviv, N.J. and Veizer, J., 2003. Celestial driver of Phanerozoic climate?. *GSA today*, 13(7), pp.4–10.

<sup>18</sup> Shaviv, N.J., 2005. On climate response to changes in the cosmic ray flux and radiative budget. *Journal of Geophysical Research: Space Physics*, 110(A8).

<sup>19</sup> Svensmark, H., 2007. Cosmoclimatology: a new theory emerges. *Astronomy & Geophysics*, 48(1), pp.1–18.

<sup>20</sup> Raspopov, O.M., Dergachev, V.A., Esper, J., Kozyreva, O.V., Frank, D., Ogurtsov, M., Kolström, T. and Shao, X., 2008. The influence of the de Vries (~ 200-year) solar cycle on climate variations: Results from the Central Asian Mountains and their global link. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 259(1), pp.6–16.

(2009),<sup>21</sup> Lüdecke et al. (2013).<sup>22</sup>

## 2. Motivation

According to a statement published on the website of the UN convention on climate change, “Ethiopia intends to achieve its vision of becoming **carbon-neutral**, with the mid-term goal of attaining middle-income status”<sup>23</sup> (emphasis added). World Bank Group President Jim Yong Kim, during his July 14, 2015 meeting with Prime Minister Hailemariam Desalegn in Addis Ababa, he appreciated Ethiopia’s aspiration to become a **carbon neutral** middle income manufacturing hub by 2025 (emphasis added). Kim commended Ethiopia for being a “long-term leader on climate change – in and beyond Africa”.<sup>24</sup> Also, in Nov. 02, 2017 Ethiopian government is in a process of changing its foreign policy to account for global climate change among other things.<sup>25</sup>

World Bank Group President Jim Yong Kim stated that “If world leaders do not find a path to low-carbon growth that will keep global warming below an increase of 2 degrees Celsius, there is little hope of ending extreme poverty — and even more broadly, there is little hope of preserving the Earth as we know it for our children and grandchildren.”<sup>26</sup> Similar statement is stated by The International Monetary Fund (IMF) in Oct. 12, 2017.<sup>27</sup>

Big oil and gas companies such as Exxon, Shell, BP, Total, etc.<sup>28</sup> are

<sup>21</sup> Svensmark, H., Bondo, T. and Svensmark, J., 2009. Cosmic ray decreases affect atmospheric aerosols and clouds. *Geophysical Research Letters*, 36(15).

<sup>22</sup> Lüdecke, H.J., Hempelmann, A. and Weiss, C.O., 2013. Multi-periodic climate dynamics: spectral analysis of long-term instrumental and proxy temperature records. *Climate of the Past*, 9(1), p.447.

<sup>23</sup> Ethiopia to cut carbon emissions by two-thirds by 2030– <https://phys.org/news/2015-06-ethiopia-carbon-emissions-two-thirds.html> Intended Nationally Determined Contribution (INDC) of the Federal Democratic Republic of Ethiopia — <http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Ethiopia/1/INDC-Ethiopia-100615.pdf>.

<sup>24</sup> Ethiopia Rising: Aspiring to Become a Carbon Neutral Middle Income Manufacturing Hub by 2025, <http://www.worldbank.org/en/news/speech/2015/07/14/ethiopia-rising-carbon-neutral-middle-income-manufacturing-hub>.

<sup>25</sup> According to EthiopiaFirst.com Nov. 02, 2017 news titled “የውጭ ጉዳይ ሀገራዊ ደህንነት ሰነድ አቀጣጣሪ ጉዳይ” (in Amharic), (sourced from FBC), Ethiopian government is in a process of modifying its foreign policy. Among the policy changes is in regard to Climate Change (in Amharic: ታላ አቀጣጣሪ ማሳያ ብለው ካቀረቡት የግለ ሥላሴ ለውጦች መካከል፤ ደቡብ ሱዳን፤ የአየር ንብረት ለውጥ እና በፍጥነት መልኩን አየቶሃደረ የመጣው የብብርተኝነት ስጋት ተጠቃሽ ናቸው።) (emphasis added) <http://www.ethiopiafirst.com/%E1%8B%A8%E1%8B%8D%E1%8C%AD-%E1%8C%89%E1%8B%B3%E1%8B%AD%E1%8A%93-%E1%88%80%E1%8C%88%E1%88%AB%E1%8B%8A-%E1%8B%B0%E1%88%85%E1%8A%95%E1%8A%90%E1%89%B5-%E1%88%B0%E1%8A%90%E1%8B%B5-%E1%8A%A5%E1%8B%A8/>Also, as stated earlier “Ethiopia intends to achieve its vision of becoming **carbon-neutral**, with the mid-term goal of attaining middle-income status” (emphasis added). Hence, this research is mainly motivated to state my disagreement with Ethiopia’s plan to become **carbon-neutral** in mid-term; and Ethiopia’s leadership in pushing the climate change agenda to African leaders and other LDCs leaders, despite there is no national interest in pushing such “climate alarmist” agenda.

<sup>26</sup> Action Urged on Climate Change, Growth Slowdown – <http://www.worldbank.org/en/news/feature/2015/10/10/action-urged-on-climate-change-growth-slowdown>.

<sup>27</sup> The International Monetary Fund (IMF) stated in Oct. 12, 2017: “Stabilizing atmospheric concentrations of greenhouse gases will require a radical transformation of the global energy system over coming decades. Fiscal instruments (carbon taxes or similar) are the most effective policies for reflecting environmental costs in energy prices and promoting development of cleaner technologies, while also providing a valuable source of revenue (including, not least, for lowering other tax burdens). Fiscal policies also have a key role to play in addressing other challenges, like building resilience to climate change and reducing local air pollution and urban congestion. Getting energy prices right has large fiscal, environmental, and health benefits at the national level, and need not wait for international action. Low energy prices, fiscal pressures, and emissions mitigation pledges made by 197 parties to the 2015 Paris Agreement create an opportune time for reform.” <http://www.imf.org/en/About/Factsheets/Climate-Environment-and-the-IMF>.

<sup>28</sup> The Economist, Nov. 18, 2015. Why Exxon Mobil would support a carbon tax — <https://www.economist.com/blogs/economist-explains/2015/11/economist-explains-12> Oliver Milman (TheGuardian, June 20, 2017), Exxon, BP and Shell back carbon tax proposal to curb emissions— <https://www.theguardian.com/environment/2017/jun/20/exxon-bp-shell-oil-climate-change> Petroff A. (CNNmoney June 20, 2017), Big Oil wants to tax itself and give cash to Americans — <http://money.cnn.com/2017/06/20/news/oil-carbon-tax-payments/index.html>.

now showing willingness to join the IPCC and UN crowd in supporting (but of course not actively lobbying) the “carbon-tax (carbon pricing) strategy to solve global climate change”. From economic point of view, it seems counterproductive for these companies to support carbon-pricing themselves; however, they are probably going to transfer all or majority of the additional carbon-tax costs directly to consumers. Therefore, in supporting carbon-tax section of the Paris accord (or similar accord), these companies are hoping to improve their public image without much cost overhead to themselves.

Analyzing the aforementioned statements by the World Bank, IMF, etc., and knowing how complex the global climate change issue is, and how these institutions (including big oil and gas companies) are trying to mitigate climate change, i.e., carbon taxing consumers and providing insignificant portion of collected carbon tax to least developed nations through Green Climate Fund,<sup>29</sup> in return, convincing or coercing LDCs<sup>30</sup> to cut their negligible CO<sub>2</sub> emission, and deceptively advising or forcing them to live in “dark” for generations to come, I am motivated to challenge and argue that there is no genuine motive in the World Bank, IMF, and other institutions “advices” (on this topic).

I argue that global warming (global climate change) is highly exaggerated to a point where it seems it is deliberately designed by these institutions and industrialized countries to hinder or slow development and industrialization prospect of LDCs. In line with my argument, Professor Denis Rancourt in his March 27, 2015 talk titled “The science and geopolitics of climate change”, at the University of Ottawa also stated that the World Bank and IMF are so fixated in selling the carbon trade (carbon tax) option to the world not for a humanitarian reason but for other hidden agenda.<sup>31</sup>

Therefore, this writing is motivated to give a personal opinion that is counter argument to the mainstream idea that is shaping policy making in Ethiopia,<sup>32</sup> and more broadly to the “accepted” policy decisions by majority of LDCs – on the issue of global warming or global climate change.<sup>33</sup> And to state my disagreement with Ethiopia’s leadership in pushing the scientifically unproven concept of “human CO<sub>2</sub> as the main cause for climate change” to African and other LDCs; and to oppose Ethiopia in becoming the main advocate for LDCs (through African Union) for LDCs to become carbon-neutral in decade or so and trying to be “the best example for that” [without properly studying the negative impact of such misguided policies on energy consumption of Ethiopia and LDCs, and its effect on the prospect of becoming industrialized nations].

This research work is mainly devoted on global climate change agreements (such as the Paris climate accord) and their effect from geopolitical, development, and energy policy perspective of Ethiopia

<sup>29</sup> UN Nov. 2011, Climate Change in Least Developed Countries — <http://www.undp.org/content/dam/undp/library/corporate/fast-facts/english/FF-Climate-Change-in-Least-Developed-Countries.pdf> And, The Green Climate Fund approves Ethiopia’s US\$50 million climate resilience proposal... (see <http://www.mfa.gov.et/web/guest/-/a-week-in-the-horn-06-102017>). These examples show that LDCs get few millions of dollars from the Green Climate Fund (GCF) for agreeing to cut their CO<sub>2</sub> emission (or plan to increase in a very slow rate). GCF is a fund established within the framework of the UNFCCC to assist developing countries in adaptation and mitigation practices to counter climate change.

<sup>30</sup> Least developed countries (LDCs) are low-income countries confronting severe structural impediments to sustainable development. They are highly vulnerable to economic and environmental shocks and have low levels of human assets. As of June 2017, there are 47 countries (including Ethiopia and many Sub-Saharan African countries) on the list of LDCs. [https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc\\_list.pdf](https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf). The population of LDCs was 954 million (13% of the world’s total) in 2015; 51% of the population of LDCs lives on less than \$1.25 per day <http://unohrls.org/about-ldcs/facts-and-figures-2/>.

<sup>31</sup> Professor Denis Rancourt in his March 27, 2015 talk titled “The science and geopolitics of climate change”, at the University of Ottawa: <https://www.youtube.com/watch?v=A-uY3tuV3yw> (part 1), and <https://www.youtube.com/watch?v=B3mnSnkgM4s> (part 2).

<sup>32</sup> *Supra*. UN Nov. 2011, Climate Change in Least Developed Countries.

<sup>33</sup> Ethiopia to voice stand of LDCs in COP23— <http://www.fanabc.com/english/index.php/news/item/10446-ethiopia-to-voice-stand-of-ldcs-in-cop23>.



and LDCs; and it is less concerned on the science of global climate change or global warming itself.

### 3. Carbon-dioxide (CO<sub>2</sub>) emission versus Human Development Index (HDI)<sup>34</sup>

Based on data analysis from a European Commission joint research center database,<sup>35</sup> Ethiopia's cumulative CO<sub>2</sub> emission in 2015 was negligible (0.027% of World Total), while that of the TOP THREE – China, USA, and India was 29.4%, 14.3%, and 6.8%, respectively. And on per capita basis, Ethiopia's CO<sub>2</sub> emission was 0.1 metric tons per capita while that of USA was 15.9 (about 160 times that of Ethiopia) (see Table 1 and Fig. 1). Hence, it is unwise decision for Ethiopia to commit reducing her essentially nonexistent carbon emission “budget” and commit herself to become a carbon neutral nation in decade or so [without studying the implication of such policy on energy and industrialization prospects of the country]. The same is true to majority of LDCs.

Ethiopia and LDCs should follow the position of China and India during the Kyoto protocol negotiations. China, Russia, and India (in addition to many LDCs of 1990's) were vehemently against Kyoto Protocol<sup>36</sup>; as their total CO<sub>2</sub> emission was very small in the 1990's, but much more than the current Ethiopia's and LDCs' CO<sub>2</sub> emission “budget” (see Table 1).

However, now things are different, China already surpassed USA and EU, and India is catching USA and EU (in total CO<sub>2</sub> emission, as seen in Table 1); hence, they are now willing to negotiate and sign the Paris agreement (along with all 197 nations).<sup>37</sup> Had their current total CO<sub>2</sub> emission (as % of the world total) were at the same level as their total CO<sub>2</sub> emission in 1990's (see Table 1), based on their strong opposition to Kyoto Protocol, it can be easily concluded that they would have been less enthusiastic to sign such unjust agreement (or unjust CO<sub>2</sub> emission “budget”).

Fig. 1 shows that logarithmic of annual CO<sub>2</sub> emission per capita has a very good positive linear correlation to HDI. Both CO<sub>2</sub> emission and HDI data in Fig. 1 are for the year 2015 listed in Table 1. Similar correlation was reported in Costa et al.

<sup>34</sup> Human Development Index (HDI) was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. It incorporates the health, knowledge and economic dimensions of a population living in a given country (see <http://hdr.undp.org/en/content/human-development-index-hdi>).

<sup>35</sup> European Commission joint research center database – <http://edgar.jrc.ec.europa.eu/overview.php?v=CO2s1990-2015>.

<sup>36</sup> The Kyoto Protocol is an international treaty which extends the 1992 UNFCCC that commits State Parties to reduce greenhouse gas emissions, based on the scientific consensus that (a) global warming is occurring and (b) it is extremely likely that human-made CO<sub>2</sub> emissions have predominantly caused it. The Kyoto Protocol was adopted in Kyoto, Japan, on December 11, 1997 and entered into force on February 16, 2005. There are currently 192 parties (see [http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php)); The United States dropped out of Kyoto in 2001. In March 13, 2001, President Bush stated “I oppose the Kyoto Protocol because it exempts 80% of the world, including major population centers such as China and India, from compliance, and would cause serious harm to the U.S. economy” (<https://georgewbush-whitehouse.archives.gov/news/releases/2001/03/20010314.html>). Canada withdrew effective December 2012. More than 100 developing countries, including China and India, were exempted from the treaty (<http://www.cnn.com/2013/07/26/world/kyoto-protocol-fast-facts/index.html>).

<sup>37</sup> All 197 countries sign the Paris agreement (the latest signatory were Nicaragua in Oct 24, 2017 and Syria in Nov 7, 2017), 169 Parties out of the 197 have ratified the agreement, [http://unfccc.int/paris\\_agreement/items/9444.php](http://unfccc.int/paris_agreement/items/9444.php); June 01, 2017, President Trump stated United States will withdraw from the Paris Climate Accord (<https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-accord>). He stated ... “.... I can put no other consideration before the wellbeing of American citizens. The Paris Climate Accord is simply the latest example of Washington entering into an agreement that disadvantages the United States to the exclusive benefit of other countries, leaving American workers ..... Thus, as of today, the United States will cease all implementation of the non-binding Paris Accord and the draconian financial and economic burdens the agreement imposes on our country.....”, his withdrawal statement was widely opposed by nationally and internationally, while of course he was praised by majority of his supporters and voters.

(2011)<sup>38</sup> for the year 2000.

Both, Table 1 and Fig. 1 indicate – annual CO<sub>2</sub> emission per capita “budget” is a good indicator of how a country is industrialized (rich). Comparing Fig. 1 of this study and Fig. 1 of Costa et al. (2011) study, one can conclude, despite a fifteen year span between the two HDI versus CO<sub>2</sub> emission analyses, there is no noticeable change to the ultimate conclusion; i.e., Annual CO<sub>2</sub> emission per capita of a given country is strongly correlated to how the country is doing well or bad in her human development. This is true not by a coincidence but through a strong scientific reason, that is – the more energy per person a country consume (hence, more CO<sub>2</sub> emission, as most energy sources are carbon intensive), the more advanced the country will be, and vice versa. Note that, as seen in Fig. 2 and Table 2, eighty-three percent (83%) of total world energy consumption in 2015 was carbon based (fossil fuels – oil, gas, and coal). Fig. 2 and Table 2 are based on International Energy Outlook 2017 report.<sup>39</sup>

Fig. 2 and Table 2 also shows that total world energy consumption is projected to grow by about 28% in 2040 compared to that of 2015. In the same period, renewable and nuclear energy is projected to grow by 70% of 2015 nuclear + renewables, while fossil fuel is projected to grow by about 19.4% of 2015 total fossil fuels. Therefore, according the 2017 international energy outlook EIA report, while the contribution of renewable and nuclear energy is expected to grow rapidly, contribution of carbon intensive energy will still be the dominant energy source in 2040 (i.e., 77.5% versus 22.5%).

The correlation in Fig. 1 may change in the future (due to advancement in renewable or clean energy); however, it will definitely take at least a decade or more, as seen in Fig. 2 and Table 2. Hence, unless Ethiopia is willing to pause her growth and transformation plan (GTP)<sup>40</sup> for a decade or more, it is not logical to cut her essentially nonexistent CO<sub>2</sub> emission “budget” (to please some nations and institutions).

Furthermore, Fig. 1 reveals Ethiopia is not only very far in both CO<sub>2</sub> emission and HDI from advanced countries such as the USA, Japan, South Korea, China, Germany, etc. but she is very far from the world average, Egypt, Kenya, and average Sub-Saharan Africa. Without exaggeration, Ethiopia is almost in the bottom of the world in both CO<sub>2</sub> emission and HDI. This should worry Ethiopian energy and development policy makers if they really want to become a middle income country in a decade or so. They should plan how to improve their CO<sub>2</sub> emission “budget” (meaning, improve their industrialization prospect), not the other way round (i.e., plan to become a carbon neutral country in a decade or so). The same is true for majority of LDCs.

### 4. Why LDCs agree to the Paris accord?

Most political leaders sign the Paris climate accord, not based on concrete evidence on the pros and cons of the agreement on socio-economic issue to their citizens (especially LDCs, such as Ethiopia), rather for political reasons; i.e., (1) fearing of being isolated by world super powers (or trying to show the world they too are the “good guys” who are concerned about the climate, though they can't properly feed their growing population); (2) to advance their global, regional, and national political stature; (3) maybe they get bad advice from their economic and energy experts; or they only listen to their environmental policy advisors; (4) to get financial aid and loans from the Western donors, the World Bank, IMF and other “Earth

<sup>38</sup> Costa, L., Rybski, D. and Kropp, J.P., 2011. A human development framework for CO<sub>2</sub> reductions. *PLoS one*, 6(12), p.e29262.

<sup>39</sup> International Energy Outlook 2017 report by EIA [https://www.eia.gov/outlooks/ieo/pdf/0484\(2017\).pdf](https://www.eia.gov/outlooks/ieo/pdf/0484(2017).pdf).

<sup>40</sup> National Planning Commission, 2010. FDRE Growth and Transformation Plan (GTP); and National Planning Commission, 2015. FDRE Growth and Transformation Plan II (GTP II).

**Table 1**

Annual CO<sub>2</sub> Emission (in Killo-Tons) of the top 20 countries/Region/Transportation industry, Ethiopia, other selected countries in Africa, and World total in 1990 and 2015; population of respective countries in 2015, calculated annual emission per capita in 2015, and Human Development Index (HDI).

Country / Region / Transportation	Country Rank by Total CO <sub>2</sub> Emission in 2015	1990 CO <sub>2</sub> Emission (Ktons) <sup>#</sup>	Percentage of World Total (of 1990)	2015 CO <sub>2</sub> Emission (Ktons) <sup>#</sup>	Percentage of World Total (of 2015)	2015 Population <sup>*</sup>	2015 CO <sub>2</sub> Emission per Capita (metric tons per capita) <sup>**</sup>	2015 HDI <sup>##</sup>
China	1	2,293,540	6.3	10,641,789	29.4	1,401,586,609	7.6	0.738
United States of America	2	5,003,720	13.8	5,172,338	14.3	325,127,634	15.9	0.920
European Union (28 countries)	3	4,385,705	12.1	3,469,671	9.6	508,504,320	6.8	0.874
India	4	649,205	1.8	2,454,968	6.8	1,282,390,303	1.9	0.624
Russian Federation	5	2,394,842	6.6	1,760,895	4.9	142,098,141	12.4	0.804
Japan	6	1,158,386	3.2	1,252,890	3.5	126,818,019	9.9	0.903
Germany	7	1,020,145	2.8	777,906	2.1	82,562,004	9.4	0.926
International Shipping	8	367,521	1.0	642,024	1.8	NA	NA	NA
Iran (Islamic Republic of)	9	202,185	0.6	633,750	1.7	79,476,308	8.0	0.774
Republic of Korea	10	269,644	0.7	617,285	1.7	49,750,234	12.4	0.901
Canada	11	448,959	1.2	555,401	1.5	35,871,283	15.5	0.920
Saudi Arabia	12	167,679	0.5	505,565	1.4	29,897,741	16.9	0.847
Indonesia	13	159,804	0.4	502,961	1.4	255,708,785	2.0	0.689
International Aviation	14	258,943	0.7	502,936	1.4	NA	NA	NA
Brazil	15	220,388	0.6	486,229	1.3	203,657,210	2.4	0.754
Mexico	16	289,946	0.8	472,018	1.3	123,799,215	3.8	0.762
Australia	17	278,332	0.8	446,348	1.2	23,923,101	18.7	0.939
South Africa	18	282,551	0.8	417,161	1.2	53,491,333	7.8	0.666
United Kingdom	19	580,313	1.6	398,524	1.1	63,843,856	6.2	0.909
Turkey	20	153,651	0.4	357,157	1.0	76,690,509	4.7	0.767
....	....	....	....	....	....	....	....	....
Egypt	30	90,270	0.249	226,985	0.626	83,386,739	2.72	0.691
....	....	....	....	....	....	....	....	....
Nigeria	46	68,925	0.190	86,896	0.240	84,705,681	1.03	0.527
....	....	....	....	....	....	....	....	....
Kenya	93	6,410	0.018	15,201	0.042	46,748,617	0.33	0.555
....	....	....	....	....	....	....	....	....
<b>Ethiopia</b>	<b>105</b>	<b>2,397</b>	<b>0.007</b>	<b>9,885</b>	<b>0.027</b>	<b>98,942,102</b>	<b>0.10</b>	<b>0.448</b>
....	....	....	....	....	....	....	....	....
Eritrea	175	48	0.0001	652	0.0018	6,737,634	0.10	0.420
....	....	....	....	....	....	....	....	....
Sub-Saharan Africa <sup>***</sup>	....	....	....	....	....	1,006,000,000	0.84	0.523
<b>World</b>	....	<b>22,670,893</b>	<b>100</b>	<b>36,240,721</b>	<b>100</b>	<b>7,324,782,225</b>	<b>4.95</b>	<b>0.717</b>

<sup>#</sup> Data from European Commission joint research center database

<sup>\*</sup> Data from Population Division of the United Nations Department of Economic and Social Affairs

<sup>\*\*</sup> Calculated values = CO<sub>2</sub> emission in 2015/Population in 2015

<sup>##</sup> Data from 2016 UN HDI report

NA – not applicable or not available

<sup>\*\*\*</sup> Population and CO<sub>2</sub> emission per capita data are from The World Bank

Friendly”<sup>41</sup> institutions through the Green Climate Fund<sup>42</sup>; (5) combination of these reasons, and other bilateral and multilateral, and regional political reasons.

Syria’s Nov 07, 2017 announcement to sign the Paris agreement while the nation is in the middle of a civil war is a good example for reason #1 (stated above). It seems President Assad wants to have friends (mostly European leaders) and minimize enemies by joining the world “club”.<sup>43</sup>

Ethiopia’s rationale not only in singing the Paris Agreement but also working hard to reduce her negligible CO<sub>2</sub> emission “budget” and planning to become a carbon neutral in a decade or so could be for a

<sup>41</sup> “Earth friendly” nations and institutions in this study refers to citizens, nations, and institutions who knowingly or unknowingly think they have a moral high ground in “saving” the Earth by providing insignificant carbon-tax money poverty-trap to LDCs, so that LDCs could not consume one-hundredth of their energy consumption (CO<sub>2</sub> emission) per capita; they think, “saving” the Earth, is worth punishing LDCs (i.e., letting them live in “dark”), but not themselves.

<sup>42</sup> *Supra*. Green Climate Fund (GCF).

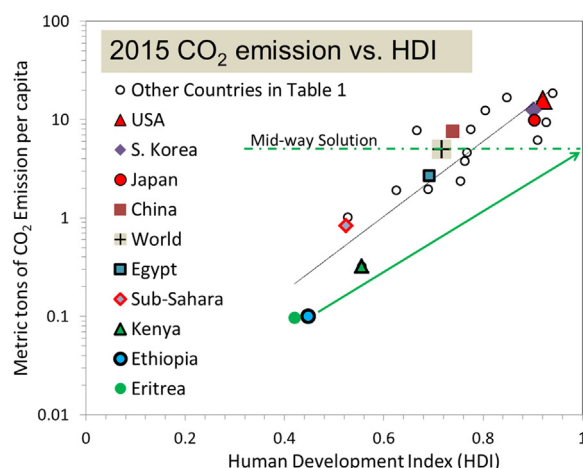
<sup>43</sup> Here Are The Real Reasons Syria Decided To Sign The Paris Climate Deal – <http://thefederalist.com/2017/11/09/syrias-entry-paris-agreement-shows-u-s-rightly-stayed/>.

combination of the above reasons (as can be deduced from the World Bank president’s statement in Addis).<sup>44</sup>

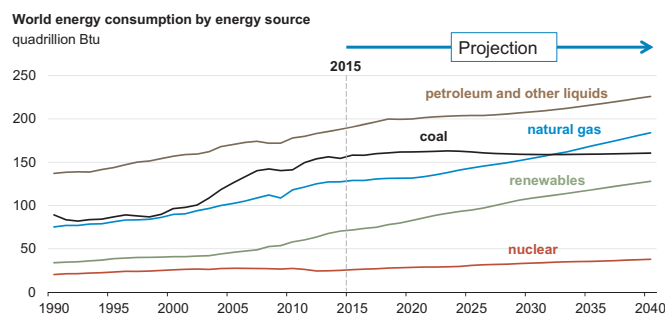
## 5. Developed countries leaders are not enthusiastic about the Paris accord

Contrary to the LDCs, majority of developed countries leaders are not so enthusiastic about the Paris accord. That is why, the USA decided to withdraw while some heavy-weight world leaders (mainly China, India, and Russia – the top three CO<sub>2</sub> emitters other than the USA, see Table 1) were not “very sad” on USA’s decision to withdraw from the Paris agreement. In fact, it may even appear that these heavy-weight world leaders were happy by President Trump’s withdrawal decision as

<sup>44</sup> Ethiopia Rising: Aspiring to Become a Carbon Neutral Middle Income Manufacturing Hub by 2025, <http://www.worldbank.org/en/news/speech/2015/07/14/ethiopia-rising-carbon-neutral-middle-income-manufacturing-hub> World Bank president stated that “I commend Ethiopia for being a long-term leader on climate change – in and beyond Africa. Climate was a subject of great importance to former Prime Minister Meles Zenawi, and it has remained a priority for today’s government, led by Prime Minister Hailemariam.”.



**Fig. 1.** Correlations between HDI and logarithm of annual CO<sub>2</sub> per capita emission in the year 2015 (plotted from the analysis listed in Table 1). This figure shows Ethiopia CO<sub>2</sub> emission per capita (and her HDI) is among the bottom of the world; also this figure shows the world average CO<sub>2</sub> emission is approximately 5 metric tons per capita (and is referred as "Mid-way Solution" that will be discussed later). Green arrow show suggested Ethiopia's path to prosperity, where Ethiopia can march to the maximum achievable HDI, 1, below the current world average CO<sub>2</sub> emission. Black line shows a linear trend of logarithmic CO<sub>2</sub> emission per capita versus HDI for all data points.



**Fig. 2.** World energy consumption by energy sources showing fossil fuels account 83% of the total consumption while renewable and nuclear energy account for only 17% in the year 2015. The projection shows that in the year 2040 the contribution of renewable and nuclear energy will grow to about 22.5% while contribution of fossil fuels will account around 77.5% (this plot is from International Energy Outlook 2017 report by EIA. International Energy Outlook 2017 report by EIA [https://www.eia.gov/outlooks/ieo/pdf/0484\(2017\).pdf](https://www.eia.gov/outlooks/ieo/pdf/0484(2017).pdf)).

they will be "free" from significant opposition (from the super power – USA) to their developmental plans and strategies – as President Vladimir Putin reminded his audience when he stated – "*Don't worry, be happy*", while answering his reaction to Trump's withdrawal from Paris accord.<sup>45</sup> This statement was stated on June 2, 2017, the next day President Trump announced his withdrawal plan from the Paris accord. Therefore, from President Putin's statement, one may infer that, generally speaking, developed countries leaders are not enthusiastic about the Paris accord (as will be clarified latter), but their citizens seem very enthusiastic, mainly because they are told (by the news media) that they are "saving the planet"<sup>46</sup> by signing the Paris accord.

<sup>45</sup> Putin takes part in plenary session of St. Petersburg International Economic Forum – <https://www.youtube.com/watch?v=p3OYwtFD9Q> (watch at 1:22:40–1:32:45). This was stated on June 2, 2017, i.e., the next day President Trump announced his withdrawal plan from the Paris Accord.

<sup>46</sup> Leaders pledge to save 'Mother Earth' despite Trump's decision to abandon Paris accord – <http://www.cbc.ca/news/technology/mother-earth-trump-paris-climate-change-1.4143004> EU to bypass Trump administration after Paris climate agreement pullout – <https://www.theguardian.com/environment/2017/jun/02/european-leaders-vow-to-keep-fighting-global-warming-despite-us-withdrawal> [in here, it is reported that German

**Table 2**

Historical (till 2015) and projected (in 2040) world energy consumption by energy source (in quadrillion Btu) [data based EIA's International Energy Outlook 2017 report].<sup>1</sup>

	1990	2000	2010	2015	2040*
Petroleum and other liquids (including biofuels)	137.23	157.02	178.04	190.58	225.99
Natural gas	75.28	89.78	118.06	128.93	184.04
Coal	89.25	96.45	141.26	158.21	160.54
Nuclear	20.36	25.65	27.38	26.00	37.93
Renewable energy (excluding biofuels)	33.89	41.01	58.06	71.72	127.97
<b>Total</b>	<b>356.00</b>	<b>409.92</b>	<b>522.80</b>	<b>575.44</b>	<b>736.46</b>
Fossil Fuels (including biofuels)	301.76	343.26	437.37	477.72	570.57
Nuclear + Renewable	54.24	66.66	85.44	97.72	165.90
<b>% of Fossil Fuels</b>	<b>85%</b>	<b>84%</b>	<b>84%</b>	<b>83%</b>	<b>77.5%</b>
<b>% of Nuclear + Renewables</b>	<b>15%</b>	<b>16%</b>	<b>16%</b>	<b>17%</b>	<b>22.5%</b>
Increase in total energy consumption between 2015 and 2040					28%
Increase in fossil fuels between 2015 and 2040					19.4%
Increase in Nuclear + Renewables between 2015 and 2040					70%

\* 2040 data is projection

<sup>1</sup> International Energy Outlook 2017 report by EIA [https://www.eia.gov/outlooks/ieo/pdf/0484\(2017\).pdf](https://www.eia.gov/outlooks/ieo/pdf/0484(2017).pdf)

## 6. LDCs should not blindly follow developed nations

If one looks closely, any industrialized nation that push enthusiastically for international agreement such as the Paris agreement (or Kyoto protocol for that matter), and vehemently oppose President Trump's decision to withdraw from the Paris accord, are countries with no considerable oil and gas resources at home. Hence, it is not surprising that they are pro alternative (renewable) energy resources and to somehow agree with the Paris accord and oppose Trump's Paris accord withdrawal decision. This is mainly, they think agreements such as the Paris accord could accelerate the phase out of fossil fuels (oil, gas, and coal) as the dominant source of energy (although this may not be the case at least for the next two decades, as discussed in Fig. 2 and Table 2), and hence, they could achieve energy security and independence sooner than later. Therefore, it is logical for these countries to think as such. However, as described in Table 1 and Fig. 1, these nations are emitting about 100 times CO<sub>2</sub> per person or more compared to Ethiopia and LDCs at this moment (in 2015); and the disparity is expected to remain at about the same ratio of CO<sub>2</sub> emission between these developed countries and LDCs, for at least a decade or two. Hence, Ethiopia and LDCs should stop looking the energy strategy of these industrialized nations; instead, LDCs should plan to bump up their CO<sub>2</sub> emission till about they reach the world average (if they really want to become industrialized countries in a decade or two).

## 7. Does Ethiopia need to worry about sea level rise?

There might be some possible risks to some coastal big cities and some small islands, due to a possible sea-level rise associated to global warming (in 50–100 years' time).<sup>47</sup> It is also worth mentioning that

(footnote continued)

Chancellor Angela Merkel stated that "We need this Paris agreement in order to save our creation" on June 2, 2017; this statement was stated a day after Trump announced his withdrawal from the Paris agreement].

<sup>47</sup> NOAA, Is sea level rising? – <https://oceanservice.noaa.gov/facts/sealevel.html> The Maldives Global Warming - "Goodbye Paradise" – <https://www.youtube.com/watch?v=33GdaaCkkKo> Mauritian President Says Climate Change Poses Dangers to Island Nation – <http://www.thecrimson.com/article/2017/4/7/mauritius-climate-change/>.

global sea level rise and fall was happening for millions of years (for example see Jouzel et al., 2007)<sup>48</sup>; and the rate at which the sea level is rising is more or less the same since 150 years ago, and nothing extraordinary is happening that can be attributed to anthropogenic CO<sub>2</sub> emission (as can be from Fig. 3 below taken from a study by Church and White, 2011).<sup>49</sup>

Church and White (2011) reported that linear trend analysis of their results shown in Fig. 3 indicated a  $1.7 \pm 0.2$  mm/year global sea level rise from 1900 to 2009, and when they analyze the linear trend from 1961 to 2009 they found a  $1.9 \pm 0.4$  mm/year global sea level rise. Hence, it is safe to conclude that there is no extraordinary global sea-level rise happening since the rapid anthropogenic CO<sub>2</sub> emission increase starting from the 1960's.

Nevertheless, there is no such sea level rise risk Ethiopia to worry at this time, unless she gets back her historic coastal lands<sup>50,51</sup>; even then, since cities around the Red Sea coasts are very small in size and population, risk of sea level rise is almost nonexistent to Ethiopia (now and in the future). Even for these sea-level rise prone island states (such as The Maldives and Mauritius), I think, their best bet is to build dams and dikes that can cope and defend any sea level rise. Such solution is in fact proven effective so far in The Netherlands, and is considered as a "promising technology" for the future of big coastal cities (though it is very costly).<sup>52</sup> Alternatively, such islands could reclaim their territories through structure building similar to the technology used in artificial island.<sup>53</sup> In fact, The Maldives are already working on artificial island technology type solutions to the sea level rise problem (Gagain, 2012).<sup>54</sup>

## 8. International climate agreements are designed and destined to fail

The Paris agreement is legally non-binding agreement<sup>55</sup>; hence, knowing the complex and wide range of interests of each signatories (i.e., 197 countries), the Paris agreement or any similar previous (such as the Kyoto protocol) or future agreements are destined to fail (as evidenced by the decision of President George W. Bush on the Kyoto protocol,<sup>56</sup> President Trump on Paris accord,<sup>57</sup> or the late withdrawal of Canada from the Kyoto protocol).<sup>58</sup> Except, such climate agreements could succeed in slowing LDCs industrialization path; hence, may

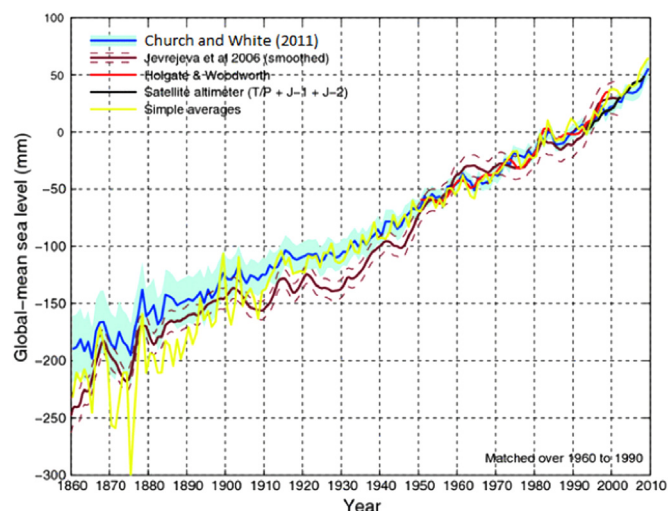


Fig. 3. Church and White (2011) global average sea level from 1860 to 2009 as estimated from the coastal and island sea-level data (blue) compared with estimates of Jevrejeva et al. (2006, brown), Holgate and Woodworth (2004, red) and from a simple average of the gauges (yellow). All series are set to have the same average value over 1960–1990 and the reconstructions are set to zero in 1990. The satellite altimetry data since 1993 is also shown in black (Church and White, 2011). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article)

achieve the possible hidden agenda behind such agreements, as will be clarified latter.

Therefore, I argue that African leaders should embrace USA's decision of withdrawal from the "destined to fail" Paris agreement. They should embrace it, because, USA's withdrawal will allow them to exercise their "freedom to develop" with available and relatively cheaper source of energy without facing fierce opposition from the super power and institutions such as the World Bank and IMF.

## 9. Can being an oil importer country be a justification to strictly implement the Paris accord?

Ethiopia's rationale to rush into ratifying (and probably ambitiously implementing) the Paris climate accord, and plan to become a carbon neutral nation in a decade or so, could be because currently she is almost entirely dependent on imported fossil fuels and domestically generated hydroelectric power.

However, this may change in the future, and Ethiopia could become hydrocarbon producer and exporter (especially gas and coal) in the near future<sup>59</sup>; hence, Ethiopia should not commit herself to reduce her almost nonexistent CO<sub>2</sub> emission (as discussed in Table 1 and Fig. 1) and ambitious to become a carbon neutral nation, without studying the effect of such ambition on her industrial development prospect.

Such scientifically unsupported energy and development policy ambition can add huge costs to the currently planned or already constructed industrial parks<sup>60,61</sup> and fertilizer plants.<sup>62</sup> These industries

<sup>48</sup> Jouzel, J., Masson-Delmotte, V., Cattani, O., Dreyfus, G., Falourd, S., Hoffmann, G., Minster, B., Nouet, J., Barnola, J.M., Chappellaz, J. and Fischer, H., 2007. Orbital and millennial Antarctic climate variability over the past 800,000 years. *Science*, 317(5839), pp.793–796.

<sup>49</sup> Church, J.A. and White, N.J., 2011. Sea-level rise from the late 19th to the early 21st century. *Surveys in geophysics*, 32(4–5), pp.585–602.

<sup>50</sup> Gabre-Sellassie, Z., 2013. Yohannes IV of Ethiopia: A political biography. *The Red Sea Press, Inc* (November 2013).

<sup>51</sup> Kahsay, A.T., 2007. Ethiopia's Sovereign Right of Access to the Sea under International Law. LLM Theses and Essays. University of Georgia, Paper 81.

<sup>52</sup> The Dutch Have Solutions to Rising Seas. The World Is Watching – <https://www.nytimes.com/interactive/2017/06/15/world/europe/climate-change-rotterdam.html>.

<sup>53</sup> BBC, 27 October 2017, How artificial islands could help us adapt to climate change – <http://www.bbc.com/future/story/20171027-how-artificial-islands-could-help-us-adapt-to-climate-change> and What China Has Been Building in the South China Sea – <https://www.nytimes.com/interactive/2015/07/30/world/asia/what-china-has-been-building-in-the-south-china-sea.html>.

<sup>54</sup> Gagain, M., 2012. Climate Change, Sea Level Rise, and Artificial Islands: Saving the Maldives' Statehood and Maritime Claims through the Constitution of the Oceans. *Colo. J. Int'l Envtl. L. & Pol'y*, 23, p.77.

<sup>55</sup> Paris Climate Agreement Q&A – <https://www.c2es.org/content/paris-climate-agreement-qa/>.

<sup>56</sup> Letter from the President George W. Bush to Senators Hagel, Helms, Craig, and Roberts, March 13, 2001 – <https://georgewbush-whitehouse.archives.gov/news/releases/2001/03/20010314.html>.

<sup>57</sup> President Trump statement on the Paris Climate Accord, June 01, 2017 – (<https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-accord>).

<sup>58</sup> Canada pulls out of Kyoto protocol – <https://www.theguardian.com/environment/2011/dec/13/canada-pulls-out-kyoto-protocol>.

<sup>59</sup> China Poly Sees Ethiopia Gas Exports by 2019 – <https://www.bloomberg.com/news/articles/2017-11-03/china-poly-to-start-ethiopia-gas-exports-by-2019-minister-says>.

<sup>60</sup> Oqubay, A., 2015. Made in Africa: industrial policy in Ethiopia. Oxford University Press, USA. Extensive development of industrial parks– <http://www.investethiopia.gov.et/investment-opportunities/strategic-sectors/industry-zone-development>.

<sup>61</sup> Oqubay, A., 2017. Ethiopia: Lessons from an experiment. In "Industrialize Africa: Strategies, policies, institutions and financing" African Development Bank Group; Chapter 5 (page 121 – 142).

<sup>62</sup> Ethiopia building 5 fertilizer plants (April 2014 news) <http://www.worldbulletin.net/news/133978/ethiopia-building-5-fertilizer-plants> Fertilizer produces far more greenhouse gas than expected– <https://www.sciencenews.org/article/fertilizer-produces-far-more-greenhouse-gas-expected>.



should access which ever cheaper raw materials and energy resources at their disposal (including gas, coal, and oil, if it exists at home or even by importing from nearby countries such as the Sudan and South Sudan and the international market).

According to *Nature* 2012 study,<sup>63</sup> one-third of greenhouse gas emission comes from agriculture (i.e., from fertilizer industries, food storage, food packaging, etc.), hence, Ethiopia committing herself to become a carbon neutral nation in a decade or so does not only affect her industrialization prospect, but it also affect her agriculture modernization dream. The same is true for majority of least developed nations.

I also would like to add that countries such as Japan,<sup>64</sup> South Korea,<sup>65</sup> Germany<sup>66</sup> have no significant oil and gas resources at home, but their CO<sub>2</sub> emission per capita is similar or higher than most developed nations (including USA) (see Table 1 and Fig. 1); this is because they import huge amount of carbon based energies to feed their industries, transportation, etc.

Hence, lack of known oil and gas resources at home cannot and should not be a valid reason for a country (such as Ethiopia) to commit herself to become a carbon neutral country, while at the same time she is trying to emulate South Korea in becoming an industrial hub in Africa. It is almost impossible to emulate South Korea's industrialization path and at the same time plan to become a carbon neutral country in near future. Thus, Ethiopia should concentrate on development (both modern agriculture and industry) rather than worrying too much for something which is not a very high and immediate risk to her survival, at least in short to mid-terms (10–20 years) and mid to long-terms (20–100 years).

Ethiopia and LDCs should understand that coal, oil, and gas (in that order) was source of industrial revolution for most developed nations starting from about 1760 (Smith A., 1776<sup>67</sup>; Wrigley 2013<sup>68</sup>); and will continue to be the main driver for industrialization of majority of nations (Energy Outlook 2017 report<sup>69</sup>; Zou et al., 2016<sup>70</sup>); hence, the best approach for any country (including Ethiopia) is to harness all sources of energy (including fossil fuels) at home, and import and use them as long as the economic feasibility allowed it (i.e., without worrying that much on CO<sub>2</sub> emission issue). Also, it should be understood that fossil (petroleum products) is not just energy but a source of raw material for many chemical products including in pharmaceutical, solvents, fertilizers, pesticides, plastics, polymers, etc.<sup>71</sup>

To be clear, I am not suggesting that Ethiopia should change her main strategy from renewable energies (i.e., solar, wind, hydro, etc.) intensive to nonrenewables (i.e., oil, gas, and coal). In fact, the future of Ethiopia seems more dependent on clean energy (including nuclear energy), due to her limited known oil and gas resources (although this might change in the future). My main argument is that – Ethiopia should not commit to reduce her essentially nonexistent CO<sub>2</sub> emission to please Western donor countries and institutions. In fact, she should

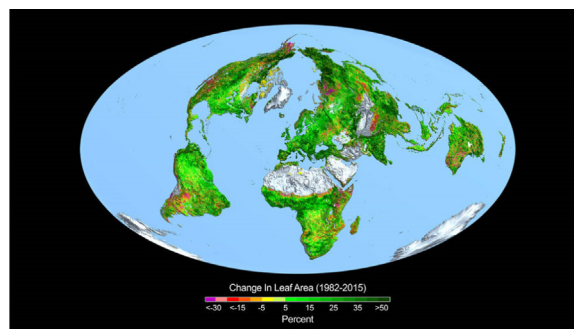


Fig. 4. Image showing the change of leaf area across the globe from 1982 to 2015. This image shows, from a quarter to half of Earth's vegetated lands has shown significant greening over the last 35 years largely due to rising levels of atmospheric carbon dioxide, and Ethiopia is in the "green zone", means that global CO<sub>2</sub> concentration increase may lead to increase in greening. *Ibid*.

properly mix all sources of energy, just not for the sake of energy security but in order to catch the developed world in owning diversified and advanced technologies.

## 10. Fertilization effect of CO<sub>2</sub>

Assuming the IPCC projection of doubling CO<sub>2</sub> concentration from the current level of about 400–800ppm leads to a 1.5–2 degree Celsius increase in global average temperature per century is correct (which there is significant disagreement on such projection<sup>72</sup>), I do not think it is a great danger that most African governments need to worry at this moment. In fact there are some scientific studies that shows increase in atmospheric CO<sub>2</sub> concentration can lead to an increase in agricultural production due to green-house and fertilization effect of CO<sub>2</sub> on plants (see Fig. 4 from NASA and Zhu, Piao, Myneni et al., 2016).<sup>73</sup>

An international team of 32 authors from 25 institutions in eight countries were involved in Zhu, Piao, Myneni et al., (2016) *Nature Climate Change* journal study. They used NASA's moderate resolution imaging spectrometer and NOAA's very high resolution radiometer instruments for their modeling study. Among other conclusions, these scientists concluded that forests of The Amazon and Central Africa become greener in the past 35 years mainly due to CO<sub>2</sub> concentration increase in the atmosphere.

Details of image analysis to generate Fig. 4 maybe referred to the third author of the paper (Professor Ranga Myneni of Boston University, Department of Earth & Environment), July 19, 2012 NASA Ames Summer Short Course video, titled "Trends or Variability: Studies Using Satellite Vegetation Index Data" and available at NASA Earth Exchange YouTube video collections.<sup>74</sup>

Vegetation Remote Sensing & Climate Research Professor Ranga Myneni<sup>75</sup> at Boston University, Department of Earth & Environment

<sup>63</sup> One-third of our greenhouse gas emissions come from agriculture– <https://www.nature.com/news/one-third-of-our-greenhouse-gas-emissions-come-from-agriculture-1.11708>.

<sup>64</sup> Japan is the second largest net importer of fossil fuels in the world: <https://www.eia.gov/todayinenergy/detail.php?id=13711>.

<sup>65</sup> South Korea relies on imports to meet about 98% of its fossil fuel consumption– <https://www.eia.gov/beta/international/analysis.cfm?iso=KOR>.

<sup>66</sup> Germany was the largest energy consumer in Europe and the seventh-largest energy consumer in the world in 2015: <https://www.eia.gov/beta/international/analysis.cfm?iso=DEU>.

<sup>67</sup> Smith A. 1776. An inquiry into the nature and causes of the wealth of nations (ed E Cannan, 1961), 5th edn. Chicago, IL: Chicago University Press.

<sup>68</sup> Wrigley, E.A., 2013. Energy and the English industrial revolution. *Phil. Trans. R. Soc. A*, 371(1986), p.20110568.

<sup>69</sup> *Supra*. International Energy Outlook 2017.

<sup>70</sup> Zou, C., Zhao, Q., Zhang, G., and Xiong, B., 2016. Energy revolution: From a fossil energy era to a new energy era. *Natural Gas Industry B*, 3(1), pp.1–11.

<sup>71</sup> American Chemical society, Organic Chemistry, <https://www.acs.org/content/acs/en/careers/college-to-career/areas-of-chemistry/organic-chemistry.html>.

<sup>72</sup> Prof. Murry Salby's talk in Hamburg, Germany, on 18 April 2013, titled: "Relationship between Greenhouse Gases and Global Temperature" – [https://www.youtube.com/watch?v=2R0w\\_cDKw0c](https://www.youtube.com/watch?v=2R0w_cDKw0c) Is Climate Change Dangerous? Former NOAA Meteorologist David Dilly – Extremely Cold 2025–2050 – <https://www.youtube.com/watch?v=GiLbBy8BEY>.

<sup>73</sup> Zhu, Z., Piao, S., Myneni, R.B., Huang, M., Zeng, Z., et al., 2016. Greening of the Earth and its drivers. *Nature climate change*, 6(8), pp.791–795. And NASA website – <https://www.nasa.gov/feature/goddard/2016/carbon-dioxide-fertilization-greening-earth>.

<sup>74</sup> Professor Ranga Myneni (of Boston University, Department of Earth & Environment), July 19, 2012 NASA Ames Summer Short Course video available at NASA Earth Exchange youtube collection, titled "Trends or Variability: Studies Using Satellite Vegetation Index Data" <https://www.youtube.com/watch?v=nHBWvX9qGu0>.

<sup>75</sup> Prof. Ranga B. Myneni – Vegetation Remote Sensing & Climate Research at Department of Earth & Environment, Boston University, USA – <http://sites.bu.edu/clive/people/professors/prof-ranga-b-myneni/>; <https://scholar.google.com/citations?user=NczWU8AAAAAJ&hl=en&oi=sra>.



(the third author of Zhu, Piao, Myneni et al., 2016) has in fact published similar findings (as a lead author) in his April 1997 *Nature* study titled “Increased plant growth in the northern high latitudes from 1981 to 1991” (Myneni, Keeling, Tucker, Asrar, and Nemani, 1997).<sup>76</sup> A year earlier than the Myneni et al., (1997) publication, Keeling, Chin and Whorf published their *Nature July 1996* paper titled “Increased activity of northern vegetation inferred from atmospheric CO<sub>2</sub> measurements”.<sup>77</sup> Similarly, studies by Idso and Idso (1994)<sup>78</sup> reviewed a ten year (1984–1994) studies on the positive (fertilization effect) of CO<sub>2</sub> on plants, however, it seems it has to be a “negative effect of CO<sub>2</sub>” that gets special attention by “world leaders” and “the mainstream media”, who they think they care a lot about our earth and humanity than the rest of us.

Fertilization effect of CO<sub>2</sub> – enhancement of photosynthesis due to rising CO<sub>2</sub> concentration – is well understood phenomenon by botanists and ecologists (see [Appendix B](#) for additional discussions). Therefore, the statements by known climate scientists (Dr. Lindzen, Dr. Happer, Dr. Moore, Dr. Carter, and Dr. Dyson) listed at the [Appendix A](#), the result reported in Zhu et al. (2016), and other similar statements such as in a 2015 study by Goklany, I. M., title “Carbon Dioxide: The Good News”,<sup>79</sup> Idso et al. (2015) study titled “Why Scientist Disagree about Global Warming”<sup>80</sup> are worth noting. Hence, energy and development policy makers in Ethiopia (and LDCs, in general) should take such studies seriously before rushing into a decision on global warming or global climate change one-sided, wildly exaggerated, and more importantly politically driven (and less scientific) arguments that could cause a huge and an irreversible negative impact on their future generations destiny. Policy makers should understand that the decision they make now could free the future generations of their citizens or could prolong the states-quo of dependency for basic needs (such as food) on neo-colonial masters (as will be discussed later).

## 11. CO<sub>2</sub> versus pharmaceutical drugs argument

Although I am not convinced on the apocalyptic scenarios of negative effect of global climate change (global warming) as depicted in *The Inconvenient Truth* (a 2006 documentary movie by Al Gore,<sup>81</sup> former US vice president), I do realize that there might be some negative impacts of CO<sub>2</sub> emission increase, such as erratic local climate change that could affect the prospect of Ethiopia’s (or other LDCs) prosperity. This, however, is true not only for atmospheric CO<sub>2</sub> concentration increase, but it is true for almost all technologies and modernizations on earth – including pharmaceutical drugs; i.e., all “good” things have some negative side effects.

Therefore, it is a specific country’s choice to optimize the good effect, while minimizing the side effect of a given technology – such as,

<sup>76</sup> Myneni, R.B., Keeling, C.D., Tucker, C.J., Asrar, G. and Nemani, R.R., 1997. Increased plant growth in the northern high latitudes from 1981 to 1991. *Nature*, 386(6626), p.698.

<sup>77</sup> Keeling, C.D., Chin, J.F.S. and Whorf, T.P., 1996. Increased activity of northern vegetation inferred from atmospheric CO<sub>2</sub> measurements. *Nature*, 382(6587), p.146.

<sup>78</sup> Idso, K.E. and Idso, S.B., 1994. Plant responses to atmospheric CO<sub>2</sub> enrichment in the face of environmental constraints: a review of the past 10 years’ research. *Agricultural and Forest Meteorology*, 69(3–4), pp.153–203.

<sup>79</sup> Goklany, I.M., 2015. Carbon Dioxide: The Good News. *The Global Warming Policy Foundation*.

<sup>80</sup> Idso, C., Carter, R. and Singer, F., 2015. Why Scientists Disagree about Global Warming. *The Heartland Institute. Non Profit Research Organization*.

<sup>81</sup> Former US vice president Al Gore shares a 2007 Nobel Peace Prize along with Intergovernmental Panel on Climate Change (IPCC) [https://www.nobelprize.org/nobel\\_prizes/peace/laureates/2007/](https://www.nobelprize.org/nobel_prizes/peace/laureates/2007/); according to The Nobel Peace Prize committee, Al Gore and IPCC were awarded “for their effort to build up and disseminate greater knowledge about man-made climate change”, but in reality, Al Gore was awarded for wide spreading highly exaggerated and some untrue information on man-made global warming through his Armageddon movie, titled *The Inconvenient Truth*. According to BBC Oct 11, 2007, a UK high court judge found nine key scientific errors in his movie <http://news.bbc.co.uk/2/hi/7037671.stm>.

work to achieve higher human development index by increasing industrialization (which is typically equivalent to increasing CO<sub>2</sub> emission budget), while minimizing the negative side effect of CO<sub>2</sub> emission on climate. More importantly, such important policy decisions should be made at a national level, rather than at a global level.

For example, Ethiopia could have a policy of minimizing erratic local climate change effects on agriculture by employing modern technologies such as drip irrigation at national level (i.e., without demanding the world to declare “war on CO<sub>2</sub>”). Such technologies are proven effective in more arid zones than most of Ethiopia’s arable land.<sup>82</sup>

It is worth mentioning that on August 22, 2017, United Nations Convention to Combat Desertification (UNCCD) announced that Tigray Killil of Ethiopia was the winner of “Future Policy Gold Award 2017” for its more than 20 years effort of land conservation and rehabilitation policy implementation through mass mobilization and the very promising results achieved in greening drylands (semi-arid lands).<sup>83</sup> This stellar achievement is an indication that despite global CO<sub>2</sub> increase and global warming (if it meaningfully happened in the last 20 or so years), correct regional policies can outpace any negative effects of global CO<sub>2</sub> concentration increase that may have on agriculture and forestry. Therefore, the solution to climate change is – correct policies at national or regional level, not global climate change agreements (such as the Paris accord). In another words, Ethiopia’s climate change mitigation policies should emanate from Addis, not from Paris!

## 12. LDCs should know their priorities well

In addition to the above compelling reasons, the most pressing issue for Ethiopia and majority of other LDCs are: population growth,<sup>84</sup> extensive poverty, widespread unemployment,<sup>85</sup> limited industrialization,<sup>86</sup> clean water, rural electrification, deforestation, dryland and desert expansion, etc.,<sup>87</sup> and *It Is Not Global Climate Change / Global Warming!*

Therefore, LDCs in general and Ethiopian government in particular, should concentrate on industrialization and development (essentially, this means increasing CO<sub>2</sub> emission, at least for the next two or more decades as discussed in [Fig. 2](#) and [Table 2](#)), and should not waste their limited resources in combating global warming (climate change).

## 13. Could carbon-tax industrial countries be a solution?

I do not think global agreements such as Paris accord, which intends to collect “carbon-tax” from rich/industrialized countries and fossil fuel consumers and provide inconsequential portion of the collected tax to LDCs, is a sound solution to solve global climate change problem.

<sup>82</sup> 12 top ways Israel feeds the world – <https://www.israel21c.org/the-top-12-ways-israel-feeds-the-world/>.

<sup>83</sup> Future Policy Award 2017 Combating Desertification and Land Degradation: The World’s Best Policies—<http://www.futurepolicy.org/healthy-ecosystems/biodiversity-and-soil/tigrays-conservation-based-adli/> [https://www.worldfuturecouncil.org/file/2017/08/FPA-Brochure-2017\\_e.pdf](https://www.worldfuturecouncil.org/file/2017/08/FPA-Brochure-2017_e.pdf) <https://www.worldfuturecouncil.org/press-release-fpa-2017/> This achievement (and award) given to Tigray may show that, despite global CO<sub>2</sub> increase and global warming (if it meaningfully happened in the last 20 or so years), correct regional policies can outpace any negative effects by CO<sub>2</sub> increase. Therefore, the solution to climate change is— correct policies at national level, not global climate change agreements.

<sup>84</sup> Addis Fortune, by Girma Feyissa, April 08, 2017, – Ethiopia’s Population Growth-It’s Consequence <https://addisfortune.net/columns/ethiopias-population-growth-its-consequence/>.

<sup>85</sup> Broussard, N. and Tekleselassie, T.G., 2012. Youth unemployment: Ethiopia country study. *International Growth Center, Working Paper*, 12, p.0592.

<sup>86</sup> By Masimba Tafirenyika, Africa Renewal: Why has Africa failed to industrialize? –<http://www.un.org/africarenewal/magazine/august-2016/why-has-africa-failed-to-industrialize>.

<sup>87</sup> Gideon Strauss, Jan 20, 2016, Six Challenges Facing Africa in 2016 – <https://providencemag.com/2016/01/six-challenges-facing-africa-2016/>.

Carbon-tax solution to climate change is sometimes referred to as – penalizing the rich and rewarding the poor through wealth re-distribution; however, in my opinion, it is “penalizing both the rich and the poor, while possibly rewarding the ultra-rich” (as will be clarified in the next section).

It is unrealistic to assume industrialized countries (such as the USA, see [Appendix C](#)) will agree to carbon-tax their citizens and give meaningful portion of the collected tax to LDCs.<sup>88</sup> This can only happen if the whole world is governed by a single president; in another words, it will never happen (at least, for the next one or two centuries).

The impracticality and unfairness of asking industrialized countries to pay meaningful portion of their hard-earned money (as a carbon-tax) to LDCs, or alternatively slow their industrialization strategy (by cutting their CO<sub>2</sub> emission) for the sake LDCs can be explained using two domestic (Ethiopian) examples described in [Appendix D](#).

To conclude, no powerful country will be willing to tax its citizens and give it away significant portion of it to help LDCs (except on “paper” agreements, where agreements are merely “scraps of paper”); in fact it is the opposite; all powerful nations work towards exploiting LDCs for the sake of their interests, as evidenced by many resource or oil-wars, including the World War I and World War II (Klare, 2002<sup>89</sup>; Yergin, 2011).<sup>90</sup>

#### 14. Carbon-tax versus financial aid

Some LDCs leaders, including former Prime Minister of Ethiopia, Meles Zenawi, think carbon-tax money (such as the Green Climate Fund, GCF) given to them by industrialized countries and institutions is their deserved money. LDCs think, they have contributed almost nothing to global climate change (global warming), but they are the most severely affected; hence, they demand developed nations should pay them enough carbon-tax money (through GCF) to cope with the effect of climate change.<sup>91</sup> On the other hand, most developed (donor) nations think they are giving LDCs a charity, not deserved money.

In my opinion, LDCs can't blame and externalize all problems that are happening to them as the problem of the developed nations, and they do not have a right to demand carbon tax as a “deserved money”, but they can beg as a charity or financial aid<sup>92</sup>; second, developed nations (and their leaders) are not naive to agree with LDCs demand and give them undeserved carbon tax money with no string attached.

For the sake of argument, let's assume developed nations will agree with LDCs demand, and the Paris “paper” agreement will be implemented, say, in the coming 20 years; then, I argue that such agreement will in fact make LDCs more dependent on carbon-tax money (financial aid), and slow down their industrialization progress. And, it is

well known fact that no country can get out of poverty and become industrialized by depending on financial aid.

Therefore, I argue “*Ethiopia and LDCs are better off without global climate change agreements (such as the Paris agreement)*” in a similar way “*Africa is better off without financial aid*”. The later argument is convincingly argued by Dambisa Mayo in her 2009 book titled “*Dead Aid: Why Aid Is Not Working and How There Is a Better Way for Africa*” (Mayo, 2009).<sup>93</sup>

#### 15. Climate change as a neo-colonialism (neo-liberalism) tool

Neo-colonialism or neo-imperialism is the practice of using capitalism, globalization and cultural imperialism to influence a developing country in lieu of direct military control (imperialism) or indirect political control (hegemony).<sup>94,95,96</sup> Then, if an international negotiation such as the Paris agreement is properly implemented (let's call it imposed, as there is explicit or implicit coercion) in Ethiopia and LDCs, it will lead to a neo-colonialism; which is against the Agenda 2063 of the African Union.<sup>97</sup> This is by making Africa and other LDCs as a generator of raw materials (less CO<sub>2</sub> emission intensive) to industries (CO<sub>2</sub> emission intensive) located in industrialized countries.

Africa, with almost untouched and huge oil and gas resources in onshore and offshore (as described in Duncan Clarke's (2010) book “*Crude Continent: The Struggle for Africa's Oil Prize*”),<sup>98</sup> should be ready to utilize her huge oil and gas resource (along other resources) and change the lives of her citizens for the better, and archive AU agenda 2063, i.e., Economic Emancipation!

Therefore, for the above reasons, I argue that it is to Ethiopia's (and majority of LDCs) advantage to embrace USA's withdrawal from the Paris agreement, and plan accordingly, rather than planning to change Ethiopia's foreign policy to address such less pressing issue (i.e., global climate change or global warming). In fact, Ethiopia should plan to increase her CO<sub>2</sub> emission “budget” as much as she can (instead of planning to become a carbon neutral in near future), if she really wants to become middle income country in decade or so. The same is true for other LDCs. I would like to stress that, there is no single developed nation on Earth that became industrialized without significantly increasing its energy consumption (i.e., CO<sub>2</sub> emission) (see [Fig. 1](#) and [Table 1](#)), and there is no reason to believe this undisputed fact will change in near future as evidenced by [Fig. 2](#) and [Table 2](#).

Former Prime Minister of Ethiopia, Meles Zenawi, described Washington Consensus institutions as a neo-liberalism (globalization) institutions and their policies were partly to blame for the rampant poverty in Africa for more than three decades.<sup>99, 100, 101</sup> Similar statements are stated in Bekele (2016)<sup>102</sup> as well. Zenawi argued the

<sup>88</sup> For example, both President Bush and President Trump stated their decision of withdrawal from the Kyoto Protocol (<https://georgewbush-whitehouse.archives.gov/news/releases/2001/03/20010314.html>) and the Paris Climate Accord (<https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-agreement>), is because such agreements are not fair to USA (and its citizens). And such arguments are convincing, especially, if anyone is looking these agreements from these president's point of view and the tax-paying citizens of the country. Citizens can give away some of their earnings willingly as a charity for whatever humanitarian cause, however, in my opinion, it is neither logical nor easy to “force” (carbon-tax) developed (industrialized) nations citizens for being “rich”.

<sup>89</sup> Klare, M., 2002. Resource wars: the new landscape of global conflict. *Macmillan*.

<sup>90</sup> Yergin, D., 2011. The prize: The epic quest for oil, money & power. *Simon and Schuster*.

<sup>91</sup> Ethiopian Prime Minister Meles Zenawi, the then chief spokesperson on climate change for the African Union (AU), reminded the leaders of developed countries on the eve of the conference that climate finance “is not aid ... it is not assistance.... It is paying the price for their ... emissions, for which we in Africa have borne the brunt for too long.” (see Michael Fleshman, April 2011, Climate talks: A faint ray of sunshine in Cancun – <http://www.un.org/africarenewal/magazine/april-2011/climate-talks-faint-ray-sunshine-cancun>).

<sup>92</sup> UN Nov. 2011, Climate Change in Least Developed Countries – <http://www.undp.org/content/dam/undp/library/corporate/fast-facts/english/FF-Climate-Change-in-Least-Developed-Countries.pdf>.

<sup>93</sup> Mayo, D., 2009. Dead aid: Why aid is not working and how there is a better way for Africa. *Macmillan*.

<sup>94</sup> Nkrumah, K., 1966. Neo-Colonialism: The Last Stage of Imperialism. 1965. New York: International.

<sup>95</sup> Nyikal, H., 2005. Neo-Colonialism In Africa: The Economic Crisis In Africa And The Propagation Of The Status Quo By The World Bank/IMF And WTO. Stanford University. <https://web.stanford.edu/class/e297a/Neo-Colonialism%20in%20Africa.pdf>.

<sup>96</sup> Bekele, F., 2016. African Predicaments & the Method of solving them effectively. Logos Verlag Berlin GmbH.

<sup>97</sup> Agenda 2063 of the African Union – <http://www.un.org/en/africa/osaa/pdf/au/agenda2063.pdf>.

<sup>98</sup> Clarke, D., 2010. Crude Continent: The Struggle for Africa's Oil Prize. *Profile books*.

<sup>99</sup> Zenawi, M., 2006. African development: dead ends and new beginnings. Internal document. Addis Ababa: EPRDF.

<sup>100</sup> Zenawi, M., 2010. The Current Global Environment and its Impact in Africa; YouTube talk by then Prime Minister of Ethiopia, Meles Zenawi at World Leaders Forum, in Columbia University's World Leaders Forum, <https://www.youtube.com/watch?v=vWoEPK9njWY>.

<sup>101</sup> Zenawi, M., 2012. States and markets: Neoliberal limitations and the case for a developmental state. In *Good growth and governance in Africa: Rethinking development strategies*, pp.140–174.

<sup>102</sup> *Supra*. Bekele 2016.

weakening of neo-liberalism (due to the financial crisis in 2007/2008) and the availability of new alternatives to neo-liberalism in emerging powers (such as China), is an opportunity Africans should seize to economically liberate themselves.

However, Zenawi could not see the global climate change issue as a neo-liberalism tool that can be used to prolong Africa's neo-colonialization. In fact, to the contrary, Zenawi was the chief spokesperson for Africa<sup>103</sup> in negotiating how to get carbon-tax money (a poverty-trap) from the same neo-liberals who is criticizing them in their failed development strategy recommendations to LDCs, while "agreeing/promising" to become carbon neutral nation in a decade or two for the sake of inconsequential (at least in the long run) carbon-tax fund. Instead, Zenawi should have negotiated how to increase Africa's CO<sub>2</sub> emission budget that can lead to a "real change" (i.e. Africa's industrialization), and in dissociating aid-money from climate change policies.

Therefore, I argue the current Ethiopia's political leadership (and other LDCs leadership) should clearly see the contradiction of Zenawi's argument on how to liberate Ethiopia (and Africa) from neo-liberalism (Washington Consensus) and become a significant industrial and man power hub for the world, on the other hand Zenawi's willingness to negotiate with the same neo-liberals to demand carbon-tax money poverty-trap, that can negatively affect his country's industrialization prospects.

Zenawi correctly noticed that China became industrialized by rejecting neo-liberal demands and advices and by following her own economic and energy policies, but he could not see that China also rejected a new form of neo-liberal demand (in the early 1990's) in the form of global climate change – that could have significantly slowed down China's CO<sub>2</sub> emission (hence, China's industrialization dream). Had China agreed with the demand of UNFCCC<sup>104</sup> (or the neo-liberals) in 1992, and slow her CO<sub>2</sub> emission, China would have significantly slowed her industrialization (economic growth), hence, there would have no "real alternative to neo-liberalism" that Zenawi argued Africans should seize the opportunity (in his 2010 Columbia University's World Leaders Forum talk).<sup>105</sup>

## 16. Climate change as a neo-cold-war instrument

In his May 14, 2016, April 2017, and June 5, 2017 talks, Noam Chomsky (philosopher, political activist, and professor emeritus at MIT), equates both proliferation of nuclear weapon and global climate change as "the two most existential threats to humanity".<sup>106</sup> Similarly, Michael Morell, a former deputy director, and latter acting director of the CIA, in Oct 2017, described "nuclear war with Russia, a biological weapons attack, and climate change are the 'only three' existential threats

to America".<sup>107</sup> It is unfortunate to hear or read such wild exaggeration of lumping global climate change on a par with nuclear and biological weapons (without any scientific or logical evidences).

Such and other similar statements mostly stated by politicians, along with movies such as *The Inconvenient Truth*, may appear as a well-designed propaganda by super-power(s) to scare not only LDCs (such as Ethiopia) but also developed countries, and make them rush in to signing and ratifying global climate accord such as the Paris accord.

Though one may assume Professor Noam Chomsky's statement as a genuine frustration by a scholar, it might not be a mere coincidence his opinion is shared by a former CIA director, Michael Morell. Hence, one might wonder if global climate change (global warming) is another tool to keep moving the cold-war confrontation (that was supposedly over in early 1990's).<sup>108</sup>

By wildly exaggerating the global climate change issue as one of the existential threat to humanity, super power(s) and The *Washington Consensus institutions* may want to use it as a tool to economically or politically punish nations who might disagree with them. Hence, no wonder why all countries sign the Paris accord<sup>109</sup> despite the science on which the agreement is based on is far from "settled".<sup>110</sup> A 2015 book titled "Why Scientists Disagree about Global Warming"<sup>111</sup> and a 2013 book titled "Taxing Air: Facts & Fallacies about Climate Change"<sup>112</sup> and other similar books and documentaries clarify that the debate between scientists on global climate change (global warming) is not over.

The good news is, it seems majority of USA's citizens and politicians do not agree with both Professor Noam Chomsky and former CIA director Michael Morell assessments, as evidenced by the Trump's election,<sup>113</sup> including in the State of Florida, where the "sea level rise" scare is supposed to be working against the then candidate Trump. However, it seems Floridians believe the solution to the sea level rise threat is at home (i.e., building defensive dikes and dams similar to the Netherlands),<sup>114</sup> not in Paris.

Hence, president Trump's June 1, 2017 statement — "I was elected to represent the citizens of Pittsburgh, not Paris" (while announcing his decision of withdrawal from the Paris climate accord),<sup>115</sup> is a statement that Ethiopia, LDCs, and the World need to embrace it; and let's hope his administration persist with that logical statement and leave alone Africans (and other LDCs) to decide their dream of becoming industrialized and utilize their resources (including oil and gas). Thus, as the solution to Floridians is in the USA, the solution to Africans is in Africa, not in Paris.

A critical look on the January 28, 2018 DW Documentary titled "US and Russian secret service collaboration on climate change",<sup>116</sup> I believe, support my argument that the "global warming scare science" could be

(footnote continued)

zWrhFqPM.

<sup>107</sup> Former CIA chief: Nuclear war with Russia, biological weapons and climate change 'only' existential threats to US – <http://www.independent.co.uk/news/world/americas/us-russia-nuclear-war-climate-change-biological-weapons-attack-only-existential-threats-cia-chief-a8022941.html>.

<sup>108</sup> Gaddis, J.L., 2006. The Cold War: a new history. *Penguin*.

<sup>109</sup> As of November 08, 2017, all 197 UNFCCC members have signed the Paris agreement. Syria was the last country to sign on Nov. 07, 2017.

<sup>110</sup> The Paris agreement and UNFCCC assumes, human CO<sub>2</sub> emission is the main cause of the climate change, and plans to mitigate it through CO<sub>2</sub> emission "budget" cut by signatories.

<sup>111</sup> *Supra*. Idso, et al., 2015.

<sup>112</sup> Carter. B, and Spooner J., 2013. Taxing Air: Facts & Fallacies About Climate Change.

<sup>113</sup> A brief history of Donald Trump's denialist position on climate change [https://www.washingtonpost.com/news/the-fix/wp/2016/09/27/a-brief-history-of-donald-trumps-denialist-position-on-climate-change/?utm\\_term=.4c0fb4a9de08](https://www.washingtonpost.com/news/the-fix/wp/2016/09/27/a-brief-history-of-donald-trumps-denialist-position-on-climate-change/?utm_term=.4c0fb4a9de08).

<sup>114</sup> The Dutch Have Solutions to Rising Seas. The World Is Watching – <https://www.nytimes.com/interactive/2017/06/15/world/europe/climate-change-rotterdam.html>.

<sup>115</sup> President Trump statement on the Paris Climate Accord, June 01, 2017 – (<https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-accord>).

<sup>116</sup> January 28, 2018, DW Documentary, US and Russian secret service collaboration on climate change – <https://www.youtube.com/watch?v=ayZ8uJjmGY>.

<sup>103</sup> Ethiopia Prime Minister Meles Zenawi, the then chief spokesperson on climate change for the African Union (AU), reminded the leaders of developed countries on the eve of the conference that climate finance "is not aid ... it is not assistance.... It is paying the price for their ... emissions, for which we in Africa have borne the brunt for too long." (see Michael Fleshman, April 2011, Climate talks: A faint ray of sunshine in Cancun – <http://www.un.org/africarenewal/magazine/april-2011/climate-talks-faint-ray-sunshine-cancun>).

<sup>104</sup> The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty adopted on 9 May 1992 and opened for signature at the Earth Summit in Rio de Janeiro from 3 to 14 June 1992. It then entered into force on 21 March 1994, after a sufficient number of countries had ratified it. The UNFCCC objective is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".

<sup>105</sup> *Supra*. Zenawi, M., 2010.

<sup>106</sup> May 14, 2016, Channel 4 News interview with Noam Chomsky titled: Who rules the world now? (at 1:50) – <https://www.youtube.com/watch?v=P2lsEVLqtS0> April 13, 2017, Noam Chomsky on the threat posed by proliferation of nuclear weapons and climate change – <https://www.youtube.com/watch?v=lysFODA1d9c> June 05, 2017, Noam Chomsky | Talks at Google (at48:20) – <https://www.youtube.com/watch?v=2C->



created to win the cold-war against the USSR and extended into a *neo-cold-war strategy* after the disintegration of USSR. In addition, despite the first World Climate Conference was held from February 12–23, 1979 in Geneva, it was not an “important” UN gathering until the IPCC creation in 1988, the Second Climate Conference in 1990, and more importantly the adoption of The United Nations Framework Convention on Climate Change (UNFCCC) at the first UN Conference on Environment and Development (Earth Summit) in Rio de Janeiro from 3 to 14 June 1992.<sup>117</sup> These dates (especially the first Earth Summit in 1992) coinciding with the end of cold-war or the disintegration of USSR, can support my assertion that “global warming scare science” could be a *neo-cold-war strategy* that might need further investigation.

## 17. Eshoh-be-eshoh (አሸክ በ(ብ) አሸክ)

As discussed above, some “climate alarmist” claim that, climate change due to anthropogenic CO<sub>2</sub> emission increase will have a “devastating consequences” if we do not act now (see for example, *The Inconvenient Truth* “documentary” by Al Gore); however, there is no scientific evidence to corroborate such extremely exaggerated claims. According to Dr. Roger Pielke (Professor at Environmental Studies Department, University of Colorado) March 29, 2017 testimony to USA House Committee on Science, Space, and Technology hearing titled “Climate Science: Assumptions, Policy Implications, and the Scientific Method”, he stated that “there is little scientific basis in support of claims that extreme weather events – specifically, hurricanes, floods, drought, tornadoes – and their economic damage have increased in recent decades due to the emission of greenhouse gases”, he continued to say, “in fact, since 2013 [the last time he gave similar testimony] the United States have had a remarkable stretch of good fortune with respect to extreme weather, as compared to the past.”<sup>118</sup>

Even if one agrees with the “climate alarmist” (such as Al Gore) claim that anthropogenic CO<sub>2</sub> concentration increase could cause a marginal global warming in a century or so leading to a mild climate change and a possible “devastating consequences”, the proper way to cope such consequences by LDCs (such as Ethiopia) should be foresighted and domestic.

In my opinion, an Ethiopian saying goes like this – *Eshoh-be-eshoh*, አሸክ በ(ብ) አሸክ (Amharic/Tigrigna), meaning “dealing thorn with a thorn” is the best approach to deal with such marginal global warming or climate change problems in the near future and a possible “devastating consequences” in a century or so.

In another words, the best way to deal climate change / global warming effects in Ethiopia (and majority of LDCs) is to burn more fossil fuels (instead woods or forests), use these fossil fuel energies (in combination with renewable energies) to combat desertification and other possible “devastating consequences” through establishment of modernized agriculture systems and through improving the living standard (HDI) of the citizens and bring them to an “equal status with the world average citizens” who are burning about 50 times CO<sub>2</sub> or more on per capita basis (see, Table 1 and Fig. 1).

## 18. Just and simple mid-way solution

As discussed earlier, the current “consensus” on global warming and global climate change is wildly exaggerated to a point where it appears a political agenda or propaganda rather than a scientific discussion. Nevertheless, assuming the IPCC forecast in global temperature and its

negative impact on Earth is real and it is time to “act” (as some scientists and some politicians believed in it), then the only solution will be for all countries to agree to come to a **mid-point**. That is, for LDCs (such as Ethiopia) to be “free” to increase (**not decrease**) their current (or 2015) CO<sub>2</sub> emission until they reach their fair “budget” (i.e., equivalent to the current world average annual CO<sub>2</sub> emission per capita, which is around 5 metric tons, see Table 1 and Fig. 1), while countries who are currently emitting more than the same fair “budget” would voluntarily work towards reducing their emission to the same **mid-point** (say, in next 10–30 years). And most importantly, the “*Earth friendly*” nations and institutions need to dissociate “aid” and “global climate change” issues.

Of course, we are living in a **real world**, and no powerful nation will agree to such “fair CO<sub>2</sub> budget” – including the countries (political leaders) and citizens that are now accusing President Trump and his administration for withdrawing from the non-binding “paper” agreement.

Again, “paper” agreements such as the Paris climate accord is, at best, designed not to create any meaningful decrease in global CO<sub>2</sub> emission (hence, global temperature); and at worst it is designed to deprive LDCs the freedom of becoming industrialized. It is designed to make LDCs dependent on a financial aid (carbon-tax) poverty-trap, instead of determining their destiny by themselves.

Therefore, Africa and other LDCs should wake-up – see the pros and cons of the Paris accord – celebrate USA’s withdrawal from the accord – follow the USA and exit from accord – and gain their freedom to archive economic emancipation, and truly achieve AU Agenda 2063!

## 19. Conclusions

International climate change agreements (such as the Paris accord and Kyoto protocol) are assessed from the perspective of geopolitical, development, and energy policy of Ethiopia and least developed countries (LDCs). The following are summary and conclusions of this study.

Ethiopia’s annual cumulative CO<sub>2</sub> emission in 2015 was negligible (0.027% of World Total), while that of the TOP THREE – China, USA, and India was 29.4%, 14.3%, and 6.8%, respectively. And on per capita basis, Ethiopia’s 2015 CO<sub>2</sub> annual emission was 0.1 metric tons per capita while that of USA was 15.9 (about 160 times that of Ethiopia) (see Table 1 and Fig. 1).

As seen in Fig. 1, logarithmic of CO<sub>2</sub> emission per capita of a given country in 2015 was directly proportional to human development index (HDI). The same was true in 2000, as reported in Costa et al. (2011). This correlation may change in the future (due to advancement in renewable or clean energy); however, it will definitely take at least a decade or more. Hence, unless Ethiopia is willing to slow or pause her growth and transformation plan (GTP) for a decade or so, it is not logical for Ethiopia to be very ambitious and plan in becoming a carbon neutral nation in a decade or two.

Fig. 1 reveals Ethiopia is not only very far in both CO<sub>2</sub> emission and HDI from advanced countries, but she is very far from the world average and average Sub-Saharan Africa; without exaggeration, Ethiopia is almost in the bottom of the world in both CO<sub>2</sub> emission and human development index. This should worry Ethiopian energy and development policy makers if they really want to become a middle income country in a decade or so (rather than planning on how to become carbon neutral nation).

Therefore, it is argued, Ethiopia should in principle agree with the World in international climate change agreements (such as the Paris agreement), purely to avoid any political and economic sanctions from “*Earth friendly*” nations and institutions; however, she should avoid becoming carbon neutral at the expense of adding costs and slowing her industrial development prospects. In fact, since CO<sub>2</sub> emission (energy consumption) is directly correlated to economic prosperity and industrialization, Ethiopia should plan to increase her CO<sub>2</sub> emission per

<sup>117</sup> Background on the UNFCCC: The international response to climate change – [http://unfccc.int/essential\\_background/items/6031.php](http://unfccc.int/essential_background/items/6031.php).

<sup>118</sup> House Committee on Science, Space, and Technology hearing, titled “Climate Science: Assumptions, Policy Implications, and the Scientific Method”, March 29, 2017, <https://www.youtube.com/watch?v=WM86Bl4jSEI> (testimony opening remark by Dr. Roger Pielke, Professor at Environmental Studies Department, University of Colorado stats is 51:12–55:51).

capita as much as possible. The same is true for majority of least developed countries (LDCs) and to all countries having low CO<sub>2</sub> emission (low energy consumption) at this moment.

As describe in *Nature 2012* study, one-third of greenhouse gas emission comes from agriculture (i.e., from fertilizer industries, food storage, food packaging, etc.), hence, Ethiopia committing herself to become a carbon neutral nation in a decade or so does not only affect her industrialization prospect, but it also affect her agriculture modernization dream.

Ethiopia should understand that climate agreements such as the Paris accord are designed and destined to fail. Hence, Ethiopia should avoid carbon-tax, different form of financial aid, **poverty-trap**; instead she should plan on how to live with the inevitable global atmospheric CO<sub>2</sub> concentration increase. The same is true for majority of LDCs. Ethiopia and LDCs are better off without global climate change agreements (such as the Paris agreement) in a similar way Africa is better off without financial aid.

The most pressing issue for Ethiopia and majority of other LDCs are: population growth, extensive poverty, widespread unemployment, limited industrialization, clean water, rural electrification, deforestation, dryland and desert expansion, etc., and it is NOT global climate change / global warming. Hence, LDCs should allocate their limited resources on the most pressing development issues, not in combating climate change.

Like most technologies, CO<sub>2</sub> can have limited side effects and more benefits; therefore, it is the specific country's choice to optimize the good effect of CO<sub>2</sub>, while minimizing its side effects. With appropriate nationwide policies and effort, increase in global atmospheric CO<sub>2</sub> concentration may be exploited for LDCs advantage (i.e., fertilization and green-house effect of CO<sub>2</sub> on plant diversity and widespread, hence, improve in agricultural productivity). Hence, LDCs can achieve higher human development index by increasing industrialization (which is typically equivalent to increasing CO<sub>2</sub> emission budget), while minimizing the negative side effect of CO<sub>2</sub> emission on climate (at a national level, rather than at a global level). In another words, Ethiopia's climate change mitigation policies should emanate from Addis, not from Paris!

Lack of known oil and gas resources at home cannot and should not be a valid reason for a given country (such as Ethiopia) to commit herself to become a carbon neutral country in decade or so, while at the same time trying to emulate carbon intensive energy importing countries in her industrialization dream (such as South Korea, Japan, and Germany).

Ethiopia and other LDCs should understand that China became industrialized nation by rejecting neo-liberal demands and advices and follow her own economic and energy policies. China increased her CO<sub>2</sub> emission (hence, industrialization dream) without worrying too much

about global climate change; hence, if LDCs want to emulate China in fast industrialization and growth, they should also look how China reacted to the UNFCCC early 1990's demand (the Kyoto protocol) to slow down CO<sub>2</sub> emission, which could have jeopardized China's development dream; and hence, the World could have been a unipolar at this moment – without a real alternative to the neo-liberalism.

A wildly exaggeration of the global climate change (global warming) issue and lumping it on a par with nuclear and biological weapons – as the most existential threat to humanity – could be a well-coordinated propaganda to keep moving the cold-war (neo-cold-war) confrontation. Such coordinated effort may be used as a tool to economically or politically punish nations who may wish to disagree with international climate change agreements.

Similar to the brilliant ancient Ethiopian saying *Eshoh-be-eshoh* [እሾኸ ለ(ብ) እሾኸ], meaning “dealing thorn with a thorn”, the best way to deal climate change effects in Ethiopia and LDCs is – to burn more fossil fuels (instead woods or forests), use these energies (in combination with renewable energies) to industrialize a given nation, and combat desertification and other possible future “devastating effects” through establishment of modernized agriculture and industrialization.

Global climate change issue could be a neo-colonial and neo-cold-war instruments designed by neo-liberal institutions; hence, if Ethiopia is willing to confront any political and economic burden from “*Earth friendly*” nations and institutions, Ethiopia should lead other Africans' towards the **mid-way solution**; and if “*Earth friendly*” countries does not agree with such “just and simple” solution; then, Ethiopia should lead Africa (through Africa Union and other regional institutions) in following USA and exit from the Paris climate accord, and Africans could gain their freedom to archive their economic emancipation – African Union Agenda 2063, by utilizing their huge resources, including fossil fuel. In doing so, Ethiopia may repeat the leadership role she played during African decolonization<sup>119</sup> struggle, where Ethiopia was a leader in bringing likeminded African leaders to form Organization of African Unity (OAU), now African Union (AU).

## Disclosure

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## Appendix A

Example of statements by known climate scientists who are skeptical on the current “consensus” by most scientists and IPCC.

- “It is propaganda. So all scientists agree it's probably warmer now than it was at the end of the Little Ice Age. Almost all Scientists agree that if you add CO<sub>2</sub>, you will have some warming. Maybe very little warming. But it is propaganda to translate that into it is dangerous and we must reduce CO<sub>2</sub>.” Dr. Richard Lindzen, retired MIT Climate Scientist.<sup>121</sup>
- “Policies to slow CO<sub>2</sub> emissions are really based on nonsense. We are being led down a false path. To call carbon dioxide a pollutant is really Orwellian.

<sup>119</sup> Africa Union website, AU in a Nutshell – <https://au.int/en/history/oau-and-au> Between 22 and 25 May 1963, delegates from 32 African countries convened in the Ethiopian capital of Addis Ababa to establish the Organization for African Unity (OAU), and renamed as Africa Union (AU) since 2001. The main objectives of the OAU were, inter alia, to rid the continent of the remaining vestiges of colonization and apartheid; to promote unity and solidarity among African States; to coordinate and intensify cooperation for development; to safeguard the sovereignty and territorial integrity of Member States and to promote international cooperation within the framework of the United Nations. Ethiopia has made major contributions to the OAU/AU in many aspects (see Maru, Mehari Taddele. “Ethiopia and the African Union.” <http://hornaffairs.com/2016/07/03/paper-ethiopia-and-african-union/>).

<sup>120</sup> Tadesse Weldu Teklu is Research Assistant Professor at Colorado School of Mines, Petroleum Engineering department. Teklu earned his PhD in Petroleum Engineering from Colorado School of Mines, USA, and his MSc in Petroleum Engineering from Universiti Teknologi PETRONAS, Malaysia. Teklu's BSc degree was in Electrical and Computer Engineering from Addis Ababa University, Ethiopia. Teklu's main research area is on the area oil and gas energy production optimization through enhanced oil recovery processes (such as CO<sub>2</sub> injection) and hydraulic fracturing technologies.

<sup>121</sup> Michael Bastasch. “‘Propaganda’: Top MIT Climate Scientist Trashes ‘97% Consensus’ Claim,” *The Daily Caller*. Archived August 28, 2016. Archive.is URL: <https://archive.is/fsB0J>

You are calling something a pollutant that we all produce. Where does that lead us eventually?" Nov. 2015, Professor Emeritus of Physics at Princeton University, Dr. Will Happer.<sup>122</sup>

- "The combustion of fossil fuels for energy to power human civilization has reversed the downward trend in CO<sub>2</sub> and promises to bring it back to levels that are likely to foster a considerable increase in the growth rate and biomass of plants, including food crops and trees. ...."Human emissions of CO<sub>2</sub> have restored a balance to the global carbon cycle, thereby ensuring the long-term continuation of life on Earth. .... "This extremely positive aspect of human CO<sub>2</sub> emissions must be weighed against the unproven hypothesis that human CO<sub>2</sub> emissions will cause a catastrophic warming of the climate in coming years. .... The one-sided political treatment of CO<sub>2</sub> as a pollutant that should be radically reduced must be corrected in light of the indisputable scientific evidence that it is essential to life on Earth." June 2016, Dr. Patrick Moore.<sup>123</sup>
- "There IS a problem with global warming. [...] it stopped in 1998. [...] That industrial carbon dioxide is not the primary cause of earth's recent decadal-scale temperature changes doesn't seem at all odd to many thousands of independent scientists. They have long appreciated - ever since the early 1990s, when the global warming bandwagon first started to roll behind the gravy train of the UN Intergovernmental Panel on Climate Change (IPCC) - that such short-term climate fluctuations are chiefly of natural origin." April 09, 2006, Robert Carter, former research professor at James Cook University, Queensland, Australia.<sup>124</sup>
- In a foreword message to Goklany (2015) book title "Carbon Dioxide: The Good News",<sup>125</sup> a world-renowned theoretical physicist and Professor Emeritus of Mathematical Physics and Astrophysics at the Princeton stated as follows. "Indur Goklany has assembled a massive collection of evidence to demonstrate two facts. First, the non-climatic effects of carbon dioxide are dominant over the climatic effects and are overwhelmingly beneficial. Second, the climatic effects observed in the real world are much less damaging than the effects predicted by the climate models, and have also been frequently beneficial. I am hoping that the scientists and politicians who have been blindly demonizing carbon dioxide for 37 years will one day open their eyes and look at the evidence."

## Appendix B

### Further discussion on: Fertilization Effect of CO<sub>2</sub>

Fertilization effect of CO<sub>2</sub> – enhancement of photosynthesis due to rising CO<sub>2</sub> concentration – is well understood phenomenon by botanists and ecologists. Allen et al. (1996)<sup>126</sup> experimented effect of elevated CO<sub>2</sub> and temperature on soybean, rice, and a broad range of other plants, and concluded that CO<sub>2</sub> fertilization effect is real. Their study show, most crop yields increase about 33% and water use decreases about 10% for a doubling of CO<sub>2</sub> concentration. According to study by Donohue et al. (2013)<sup>127</sup> CO<sub>2</sub> fertilization effect is more pronounced on warm and arid environments. Temme et al. (2015)<sup>128</sup> studied Plants growth at low (160 ppm), ambient (450 ppm), and high (750 ppm) CO<sub>2</sub> concentrations of four plant species, and as seen in Fig. 5, plants at higher CO<sub>2</sub> concentrations were bigger (larger in size) due to fertilization effect of CO<sub>2</sub>.

## Appendix C

### Climate Change Agreements and USA Politics

Assuming the claim by UNFCCC and IPCC are correct, climate change agreements may archive their intended goal – i.e., slowing down atmospheric CO<sub>2</sub> concentration and keep global warming below an increase of 2 (or 1.5) degrees Celsius in 2100 – if and only if USA (as one of the biggest CO<sub>2</sub> emitter) leads others (such as China, India, etc.) to significantly decrease their CO<sub>2</sub> emission. However, USA under both Democrat and Republican presidents will not agree to agreements such as the Paris accord. Except, of course Democrat Presidents (such as Clinton and Obama) seems willing to sign a "paper" agreement which they know will not be implemented when they leave office.

Such non-binding "paper" agreements (such as the Paris accord) are usually signed during the end term of US presidency period. This is to avoid any blowback by voters and lose election (e.g. in 1997 during Clinton presidency<sup>129</sup> and in 2015 during Obama presidency).<sup>130</sup> Considering the dynamics of US politics especially during election period, these years are not a coincidence.

In another word, it is for pretense to other world leaders (and citizens) so that these outgoing political leaders appear as more "planet friendlier" than their opponents. Otherwise, they are not willing to sign such agreement had they were seeking another "third"<sup>131</sup> term election. For example, President Obama could have tried to work with congress to ratify Kyoto protocol in his first term instead of waiting till 2015 Paris accord, had he genuinely believed that USA's withdrawal from Kyoto protocol (during President George W. Bush) was unacceptable and against the national security of USA (and against humanity in general), as many "planet friendlier" politicians and citizens in the world think as such.

Another concrete proof that President Obama was not willing to sign a climate change agreement that might affect his re-election is to revisit his

<sup>122</sup> □ Marc Morano. "Prominent Scientists Declare Climate Claims Ahead of UN Summit 'Irrational' – 'Based On Nonsense' – 'Leading us down a false path'," *Climate Depot*, November 19, 2015. Archive.is URL: <https://archive.is/MFFBR>

<sup>123</sup> □ Patrick Moore. "THE POSITIVE IMPACT OF HUMAN CO<sub>2</sub> EMISSIONS ON THE SURVIVAL OF LIFE ON EARTH" (PDF), Frontier Center for Public Policy, June 2016. Archived .pdf on file at DeSmogBlog.

<sup>124</sup> □ Carter, R., 2006. There IS a problem with global warming... it stopped in 1998 <http://www.telegraph.co.uk/comment/personal-view/3624242/There-IS-a-problem-with-global-warming...-it-stopped-in-1998.html>

<sup>125</sup> □ *Supra*, Goklany, I.M., (2015).

<sup>126</sup> Allen, L.H., Baker, J.T., Boote, K.J., 1996. The CO<sub>2</sub> fertilization effect: higher carbohydrate production and retention as biomass and seed yield. In: Bazzaz, F., Sombroek, W. (Eds.), *Global Climate Change and Agricultural Production*. FAO, Rome and John Wiley & Sons, Chichester, England, pp. 65–100.

<sup>127</sup> Donohue, R.J., Roderick, M.L., McVicar, T.R. and Farquhar, G.D., 2013. Impact of CO<sub>2</sub> fertilization on maximum foliage cover across the globe's warm, arid environments. *Geophysical Research Letters*, 40(12), pp.3031–3035.

<sup>128</sup> Temme, A.A., Liu, J.C., Cornwell, W.K., Cornelissen, J.H. and Aerts, R., 2015. Winners always win: growth of a wide range of plant species from low to future high CO<sub>2</sub>. *Ecology and evolution*, 5(21), pp.4949–4961.

<sup>129</sup> President Clinton's Remarks on Kyoto Protocol on Climate Change, Dec. 10, 1997 – <http://www.presidency.ucsb.edu/ws/?pid=53688>.

<sup>130</sup> Remarks by President Obama on the Paris Agreement, Oct. 5, 2016 – <https://obamawhitehouse.archives.gov/the-press-office/2016/10/05/remarks-president-paris-agreement>.

<sup>131</sup> XXII amendment of the US constitution (Passed by Congress March 21, 1947. Ratified February 27, 1951), states that "No person shall be elected to the office of the President more than twice, ....".



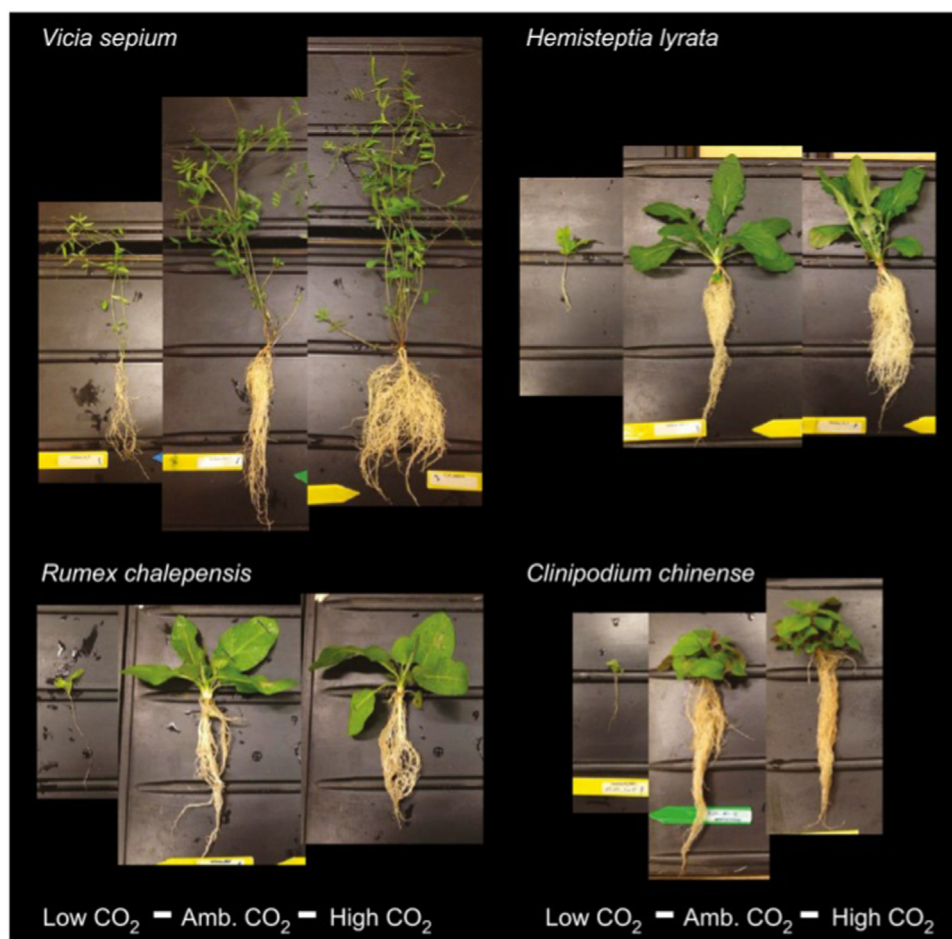


Fig. 5. Plants growth at low (160 ppm), ambient (450 ppm), and high CO<sub>2</sub> (750 ppm) concentrations of four plant species: *Vicia sepium*, *Hemisteptia lyrata*, *Rumex chalepensis*, and *Clinopodium chinense* showing about 8% increase in relative growth rate at high CO<sub>2</sub> and about 23% decrease in relative growth rate at low CO<sub>2</sub> concentration compared to ambient CO<sub>2</sub> concentration (Tamme et al., 2015). *Ibid*.

own words during his 2012 re-election campaign. One such example is, Obama's remark on March 22, 2012, in Cushing, Oklahoma,<sup>132</sup> titled "American-Made Energy". On this re-election campaign, Obama was ready to exploit the success story of "American shale revolution".<sup>133</sup>

Obama stated that, ... "Over the last three years, I've directed my administration to open up millions of acres for gas and oil exploration across 23 different states. We're opening up more than 75% of our potential oil resources offshore. We've quadrupled the number of operating rigs to a record high. We've added enough new oil and gas pipeline to encircle the Earth, and then some. . . . In fact, the problem . . . is that we're actually producing so much oil and gas . . . that we don't have enough pipeline capacity to transport all of it where it needs to go."

Such statement definitely shows that, had Obama was seeking a "third" term, he would have not signed the Paris agreement, or at least he will delay it by two or more years till the election process is over.

A December 22, 2009 BBC analysis on "Why did Copenhagen fail to deliver a climate deal?"<sup>134</sup> stated it all the World needs to understand. The article stated eight main reason why Copenhagen failed, and the following three are important to justify my point – (1) Key governments (US and BASIC = Brazil, South Africa, India, and China) do not want a global deal to happen; (2) The US political system makes it difficult for a president to pledge anything that Congress will not support, (3) Bad timing, Obama was in office only a year and he doesn't want to try something which he knows it will not be supported by the congress, etc.

So, from these three main points "Why Copenhagen failed", one can understand why President Clinton and President Obama signed during their exit years of their presidency – not during their first terms. It can be stated that they signed the Kyoto Protocol and Paris Agreements, knowing these agreements will fail after they leave office.<sup>135</sup> Signing such agreement, these outgoing presidents probably believed, will be a good legacy for them – to be viewed by the world as the true "planet saver" presidents, had their successors implemented the agreement.

<sup>132</sup> Remarks by the President on American-Made Energy, Cushing Oklahoma, March 22, 2012 – <https://obamawhitehouse.archives.gov/the-press-office/2012/03/22/remarks-president-american-made-energy>.

<sup>133</sup> Despite President Obama administration's effort to discourage oil and gas industry and encouraging "clean energy" (see President Obama's January 28, 2014 State of the Union Address, <https://obamawhitehouse.archives.gov/the-press-office/2014/01/28/president-barack-obamas-state-union-address>), the oil and gas industry was doing very good in the USA. This was mainly due to multi-stage hydraulic fracturing technology advancement (also called "Shale Revolution") enabling oil and gas industries to unlock tremendous resources from ultra-tight shale reservoirs, which were deemed uneconomical few years earlier (see for example see [https://www.eia.gov/outlooks/ieo/pdf/0484\(2017\).pdf](https://www.eia.gov/outlooks/ieo/pdf/0484(2017).pdf), International Energy Outlook 2017 report).

<sup>134</sup> BBC Dec. 22, 2009. Why did Copenhagen fail to deliver a climate deal? <http://news.bbc.co.uk/2/hi/8426835.stm>.

<sup>135</sup> President Obama's signing of the Paris Agreement is only good for nine months: <http://thehill.com/blogs/congress-blog/energy-environment/276668-president-obamas-signing-of-the-paris-agreement-is>.

What is more surprising is that, their party leaders (and next Democratic president candidates) do not seem to understand this simple logic; and own the doomed to fail climate agreements as part of their own “accomplishments” and risk to lose election(s) (in presidential, Senet, and House elections), partly for the unpopular climate agreement.<sup>136</sup>

## Appendix D

### *Ethiopian Examples: why carbon-tax is not a fair solution*

All countries, whether developing or developed, prioritize their citizens. The following two examples show how Ethiopia correctly prioritized her citizens’ prospect (against environment or other citizens’).

Example 1: expecting rich countries to carbon-tax their citizens and give meaningful portion of it away to poor countries, is an argument that is as poor as environmental NGO’s (such as International Rivers) campaigning against building hydroelectric dams – Gibe I, II, III and Grand Renaissance Ethiopian Dam, and other development projects in Ethiopia, for a weak reason that these projects are against the “ecology” or the “Earth”<sup>137</sup> (as if ecology is more important than humans).

Example 2: Ethiopia started the construction of a 6450 MW Grand Ethiopian Renaissance Dam (GERD) project on April 02, 2011 (in the Blue Nile) without notifying Egypt. Fearing the flow of Nile might be affected, Egypt was furious and demanded Ethiopia that the GERD construction should be suspended for the sake of her advantage (while ignoring Ethiopia’s dream).<sup>138</sup> Of course Ethiopia did not accept Egypt’s demand, and as of October 2017 it is more than 62% completed.<sup>139</sup> This was because Egypt’s demand was unfair and unacceptable to Ethiopia.

Similar to Ethiopia’s logic in building GERD and other projects (stated above), industrialized countries will not significantly harm their industrialization (or significantly carbon-tax their citizens) for the sake of LDCs prosperity. Except, they are willing to sign a non-binding “paper” agreements – such as the Kyoto protocol and the Paris agreement.

<sup>136</sup> Trump 2016 election winning the Rust Belt states (especially Wisconsin, Pennsylvania, Michigan and Ohio) by promising to bring back jobs (including carbon intensive industries – such as the Auto industry), can be partly associated to then candidate Trump’s position on his intension to withdraw for the Paris Agreement.

<sup>137</sup> Ethiopia’s Gibe III Dam: Sowing Hunger and Conflict – <https://www.internationalrivers.org/resources/ethiopia-s-gibe-iii-dam-sowing-hunger-and-conflict-2643> and Ethiopia slams International Rivers organization for supporting Egypt– <http://english.ahram.org.eg/NewsContent/1/64/98922/Egypt/Politics-/Ethiopia-slams-International-Rivers-organization-f.aspx>.

<sup>138</sup> The River Nile: A dam nuisance (The Economist, April 20, 2011) – <http://www.economist.com/node/18587195> How Egypt Might Try To Stop Ethiopia’s Dam Project (Jun 13, 2013, Forbes) <https://www.forbes.com/sites/stratfor/2013/06/13/how-egypt-might-try-to-stop-ethiopias-dam-project/#2ccac439ea99> Egypt demands Ethiopia halt Nile dam, upping stakes (Reuters June 5, 2013)– <http://www.reuters.com/article/us-egypt-ethiopia-dam/egypt-demands-ethiopia-halt-nile-dam-upping-stakes-idUSBRE9541EQ.> 20130605.

<sup>139</sup> Ethiopia’s Grand Renaissance Dam 62 pct complete (Xinhua, Oct. 21, 2017) – [http://news.xinhuanet.com/english/2017-10/21/c\\_136694651.htm](http://news.xinhuanet.com/english/2017-10/21/c_136694651.htm).